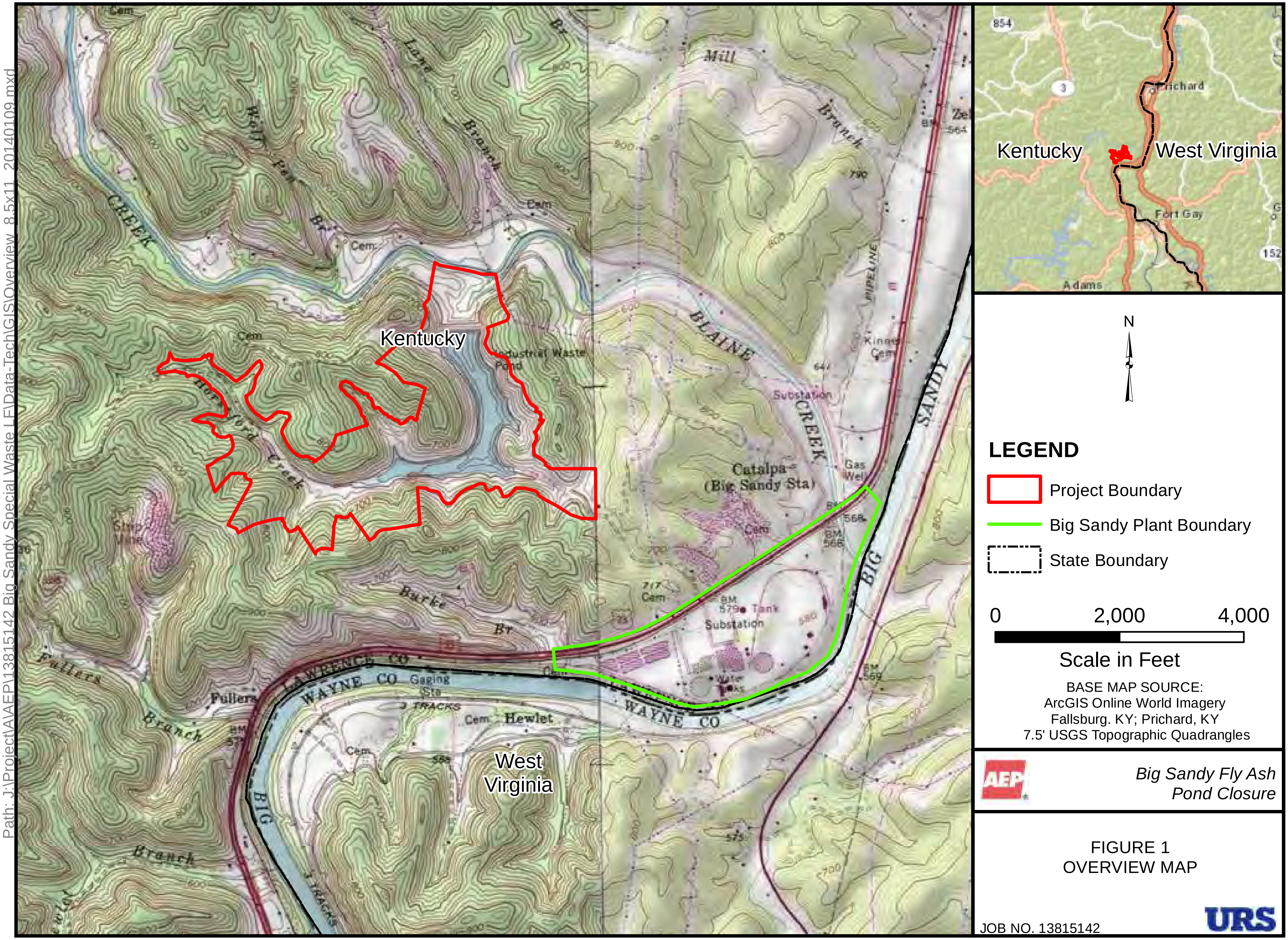

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topographic Quadrangles

Big Sandy Fly Ash
Pond Closure

FIGURE 1
OVERVIEW MAP

JOB NO. 13815142

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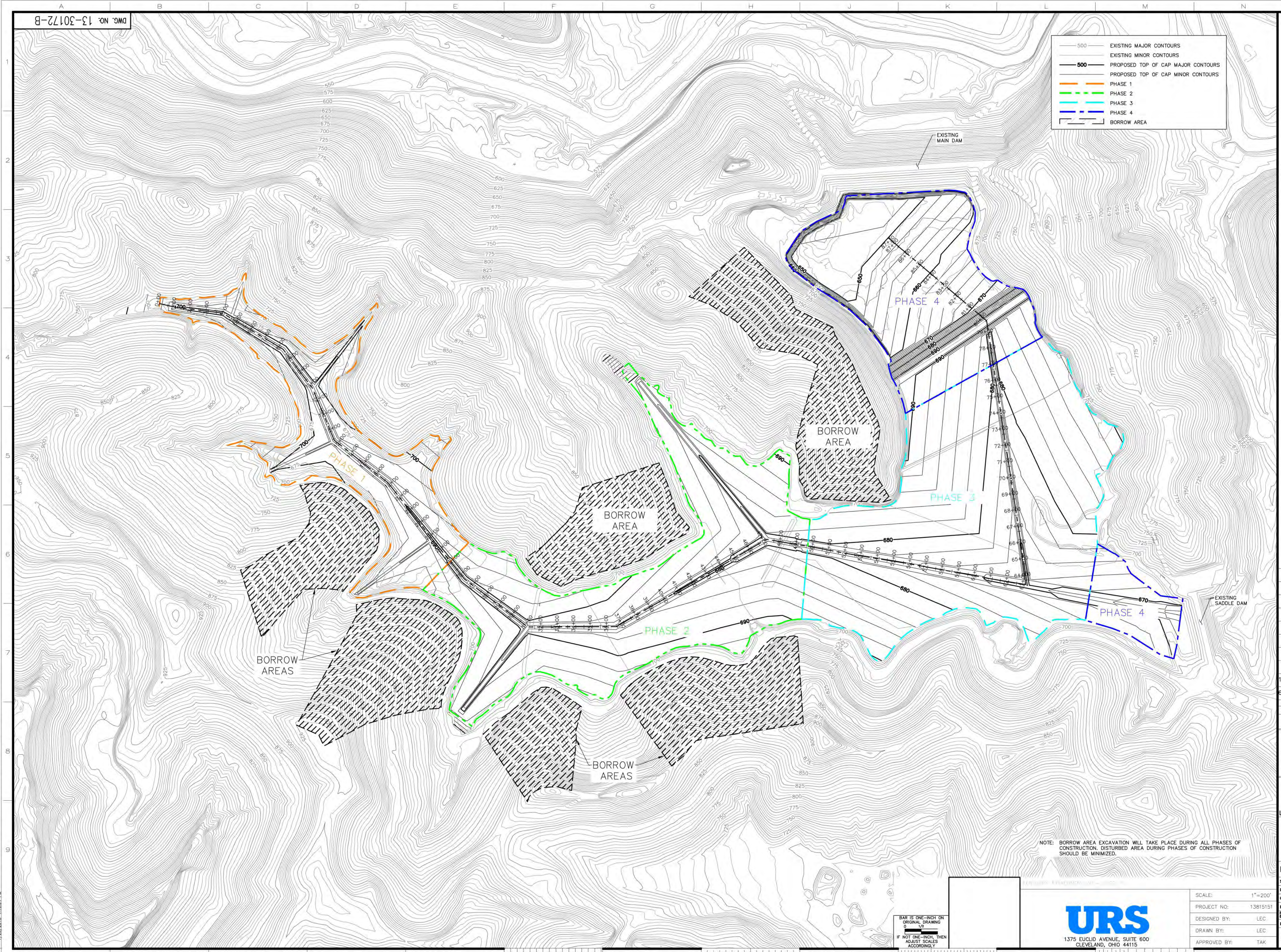

NOTE: BORROW AREA EXCAVATION WILL TAKE PLACE DURING ALL PHASES OF CONSTRUCTION. DISTURBED AREA DURING PHASES OF CONSTRUCTION SHOULD BE MINIMIZED.

N

0 200 400

SCALE: 1"= 200'

NOTES:

1. TOPOGRAPHY PROVIDED BY HENDERSON AERIAL SURVEYS INC (GROVE CITY, OHIO) VIA AERIAL PHOTOMETRIC SURVEY PERFORMED ON MARCH 9, 2007 WITH CONTOUR INTERVAL OF 2 FT SUPPLEMENTED WITH BATHYMETRIC SURVEYS PERFORMED BY AEP NEAR THE MAIN DAM ON 8/23/10 AND IN THE BACK SECTION OF THE POND ON 4/12/12. ASH POND ELEVATION FOR THE SHALLOW WATER AREAS ESTIMATED BASED ON A SURVEY PERFORMED BY AEP IN APRIL 2013.
2. THE FINAL ELEVATION OF THE CCP MATERIAL AT CLOSURE IS HIGHLY DEPENDENT ON THE AMOUNT OF COAL BURNED BETWEEN NOW AND THE TIME OF CLOSURE. THIS IS DIRECTLY RELATED TO ELECTRICITY DEMAND, BALANCING OF LOADS WITH OTHER REGIONAL POWER PLANTS, AND THE ASH CONTENT OF THE COAL BURNED. ALL OF THESE FACTORS WILL VARY CONSIDERABLY THROUGHOUT THE REMAINING LIFE OF THE BIG SANDY PLANT.
3. THE CLOSURE GRADES PRESENTED ARE BASED ON ESTIMATES OF THE AMOUNT OF ASH TO BE PRODUCED BETWEEN THE MOST RECENT SURVEY DATE AND THE DATE OF CLOSURE. GRADES DEPICTED ARE INTENDED TO REPRESENT THE GENERAL GRADING CONCEPT AT CLOSURE. ACTUAL CLOSURE GRADES FOR PORTIONS OF THE FACILITY FOOTPRINT OR THE ENTIRE FOOTPRINT MAY VARY 2 TO 10 FEET, AS NEEDED. IT IS INTENDED THAT THE MAJORITY OF THE SITE WILL HAVE A TYPICAL GRADE OF APPROXIMATELY 2%, A MINIMUM GRADE OF 0.5%, AND A MAXIMUM CAP GRADE OF APPROXIMATELY 25%.

DATE	NO.	DESCRIPTION	APPD.
1/30/15	B	REVISION BASED ON KENTUCKY DEP COMMENTS	
6/14/13	A	ISSUED FOR PERMIT – INITIAL SUBMITTAL	

REVISIONS

KENTUCKY POWER COMPANY

BIG SANDY PLANT

LOUISA KENTUCKY

SITE DEVELOPMENT

PHASING PLAN

DWG. NO. 13-30172-B

SCALE:	1"=200'
PROJECT NO:	13815151
DESIGNED BY:	LEC
DRAWN BY:	LEC
APPROVED BY:	TAK

URS
1375 EUCLID AVENUE, SUITE 600
CLEVELAND, OHIO 44115

SCALE:
DR:
CH:
ENGR:
PROJ ENGR:
DATE:
APPROVED BY

CIVIL ENGINEERING DIVISION

Fig. 2A

AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

SYSTEM DATE– DD–MM–YYYY
SYSTEM TIME– HOUR:MINUTE

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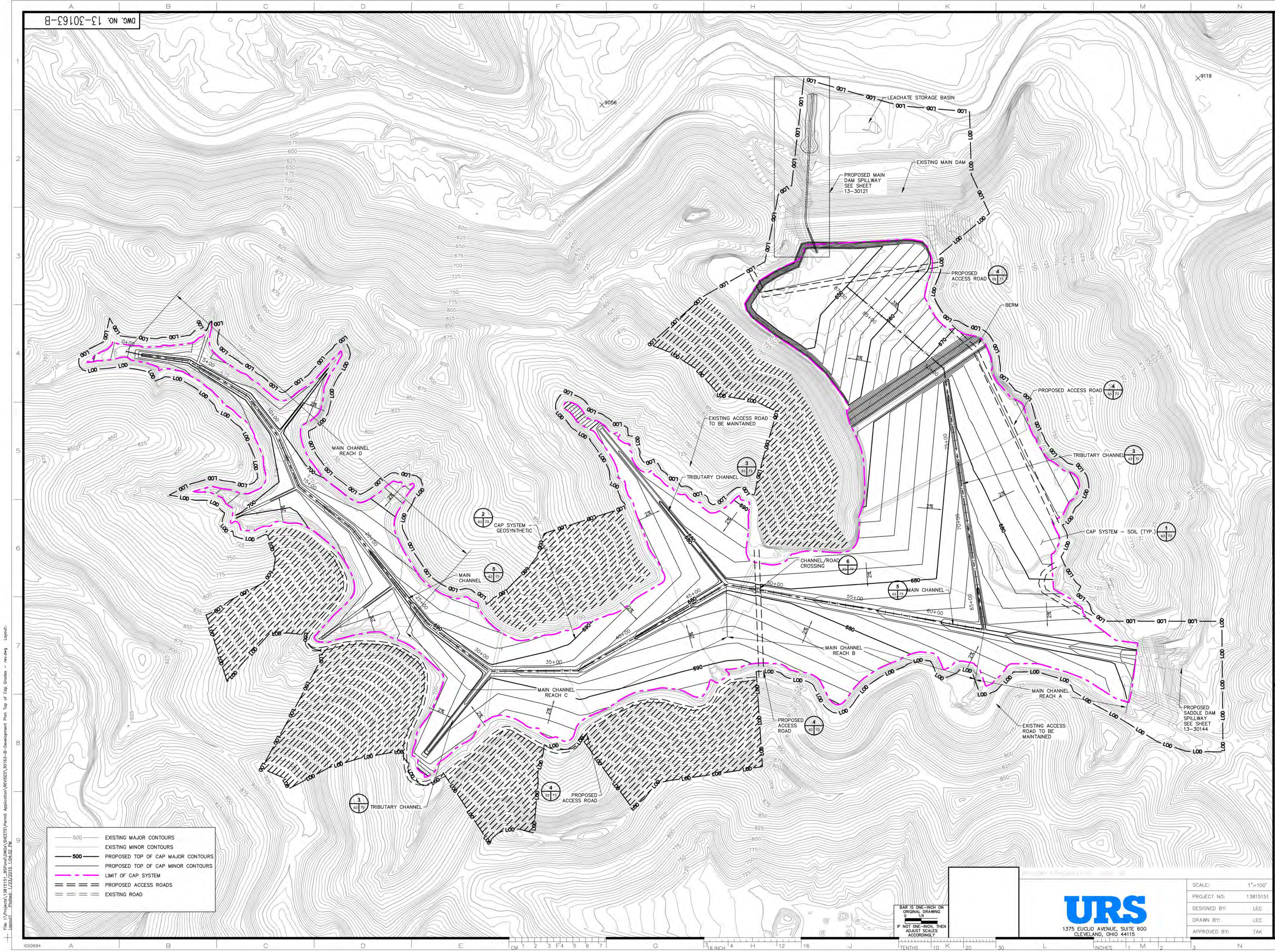

URS

1375 EUCLID AVENUE, SUITE 600
CLEVELAND, OHIO 44115

SCALE:	1"=100'
PROJECT NO:	13815151
DESIGNED BY:	LEC
DRAWN BY:	LEC
APPROVED BY:	TAK

N
0 200 400
SCALE: 1"=200'

NOTES:

1. TOPOGRAPHY PROVIDED BY HENDERSON AERIAL SURVEYS INC (GROVE CITY, OHIO) VIA AERIAL PHOTOMETRIC SURVEY PERFORMED ON MARCH 9, 2007 WITH CONTOUR INTERVAL OF 2 FT SUPPLEMENTED WITH BATHYMETRIC SURVEYS PERFORMED BY AEP NEAR THE MAIN DAM ON 8/23/10 AND IN THE BACK SECTION OF THE POND ON 4/12/12. ASH POND ELEVATION FOR THE SHALLOW WATER AREAS ESTIMATED BASED ON A SURVEY PERFORMED BY AEP IN APRIL 2013.
2. THE FINAL ELEVATION OF THE CCP MATERIAL AT CLOSURE IS HIGHLY DEPENDENT ON THE AMOUNT OF COAL BURNED BETWEEN NOW AND THE TIME OF CLOSURE. THIS IS DIRECTLY RELATED TO ELECTRICITY DEMAND, BALANCING OF LOADS WITH OTHER REGIONAL POWER PLANTS, AND THE ASH CONTENT OF THE COAL BURNED. ALL OF THESE FACTORS WILL VARY CONSIDERABLY THROUGHOUT THE REMAINING LIFE OF THE BIG SANDY PLANT.
3. THE CLOSURE GRADES PRESENTED ARE BASED ON ESTIMATES OF THE AMOUNT OF ASH TO BE PRODUCED BETWEEN THE MOST RECENT SURVEY DATE AND THE DATE OF CLOSURE. GRADES DEPICTED ARE INTENDED TO REPRESENT THE GENERAL GRADING CONCEPT AT CLOSURE. ACTUAL CLOSURE GRADES FOR PORTIONS OF THE FACILITY FOOTPRINT OR THE ENTIRE FOOTPRINT MAY VARY 2 TO 10 FEET, AS NEEDED. IT IS INTENDED THAT THE MAJORITY OF THE SITE WILL HAVE A TYPICAL GRADE OF APPROXIMATELY 2%, A MINIMUM GRADE OF 0.5%, AND A MAXIMUM CAP GRADE OF APPROXIMATELY 25%.

DATE	NO.	DESCRIPTION	APPD.
1/30/15	B	REVISION BASED ON KENTUCKY DEP COMMENTS	
6/14/13	A	ISSUED FOR PERMIT – INITIAL SUBMITTAL	

REVISIONS

KENTUCKY POWER COMPANY

BIG SANDY PLANT

LOUISA **KENTUCKY**

DEVELOPMENT PLAN 2
TOP OF CAP GRADES
ATTACHMENT 20

DWG. NO. 13-30163-B

SCALE:
DR:
CH:
ENGR:
PROJ ENGR:
DATE:
APPROVED BY

CIVIL ENGINEERING DIVISION

Fig. 2B

AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

SYSTEM DATE– DD–MM–YYYY
SYSTEM TIME– HOUR:MINUTE

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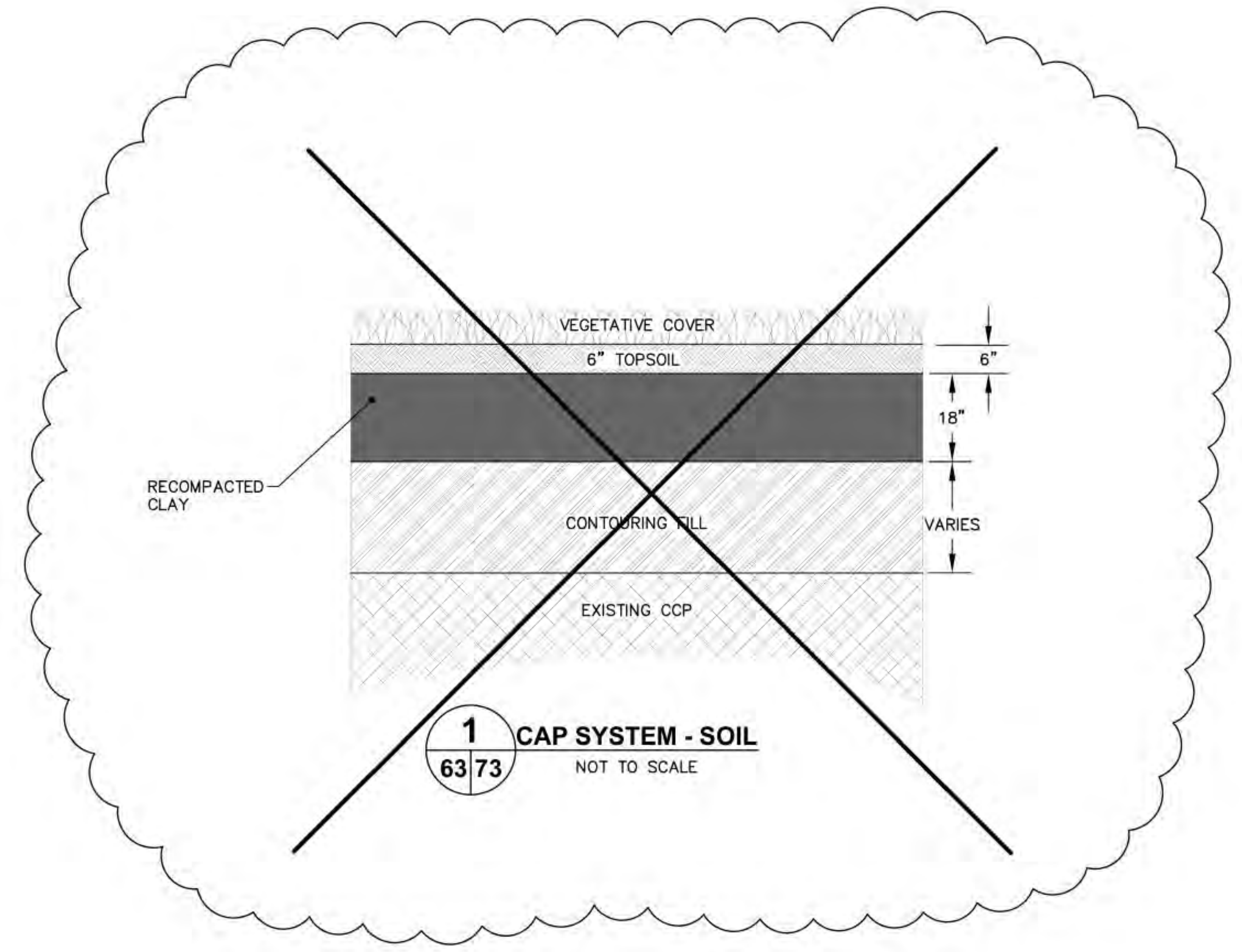
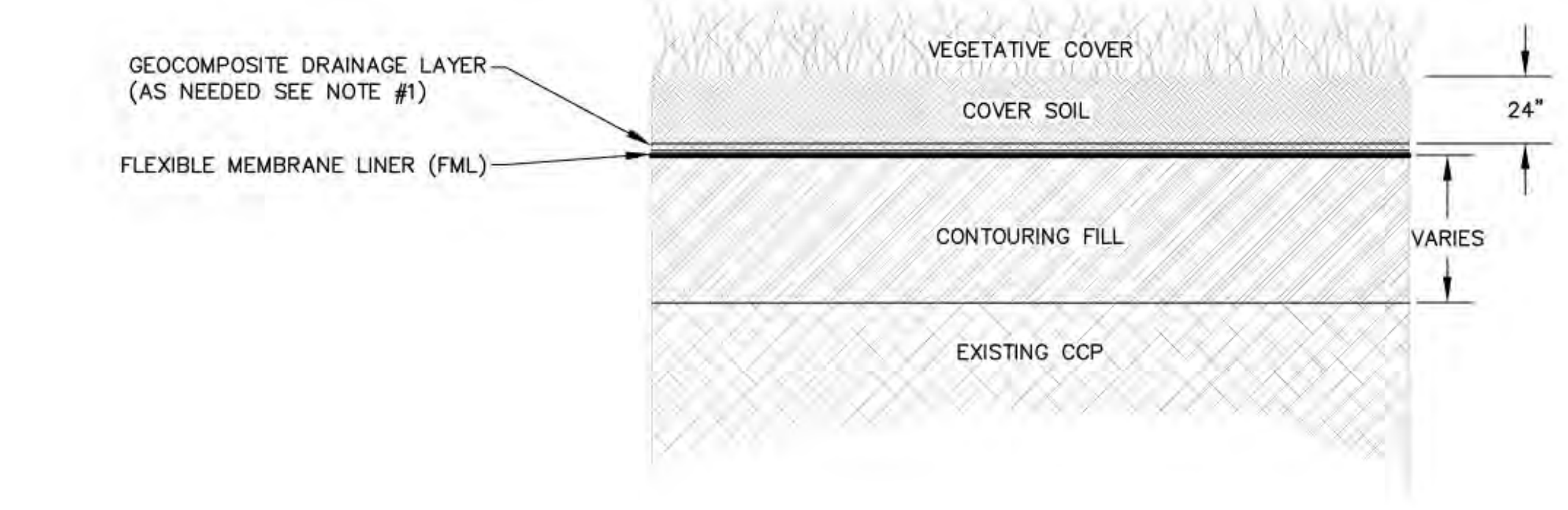


1 CAP SYSTEM - SOIL
63|73

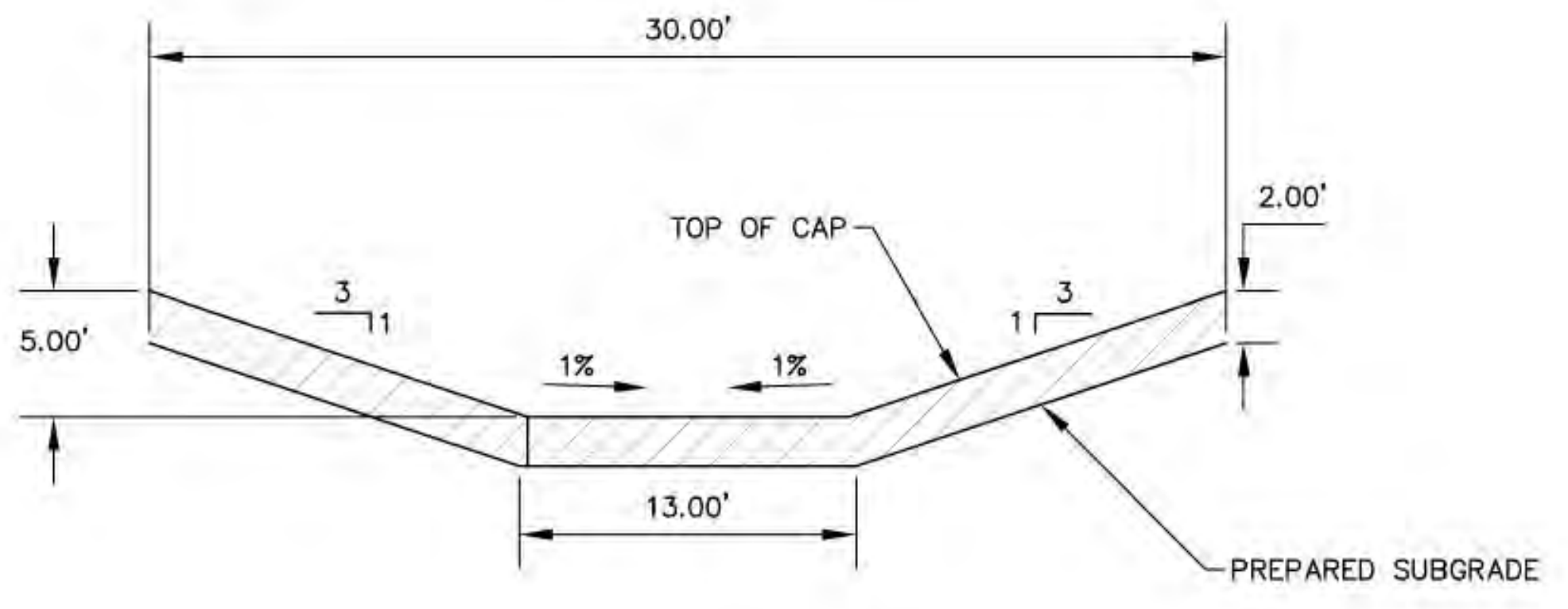
NOT TO SCALE



2 CAP SYSTEM - GEOSYNTHETIC
63|73

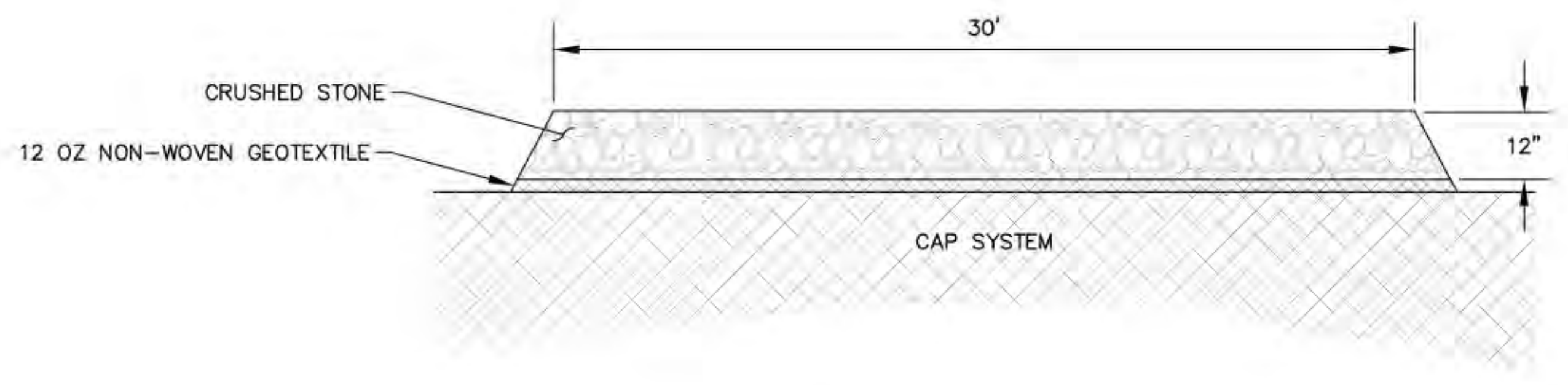
NOT TO SCALE

NOTE #1: THE GEOCOMPOSITE DRAINAGE LAYER WILL BE INSTALLED IN AREAS WITHIN 50 FEET OF THE DRAINAGE CHANNELS



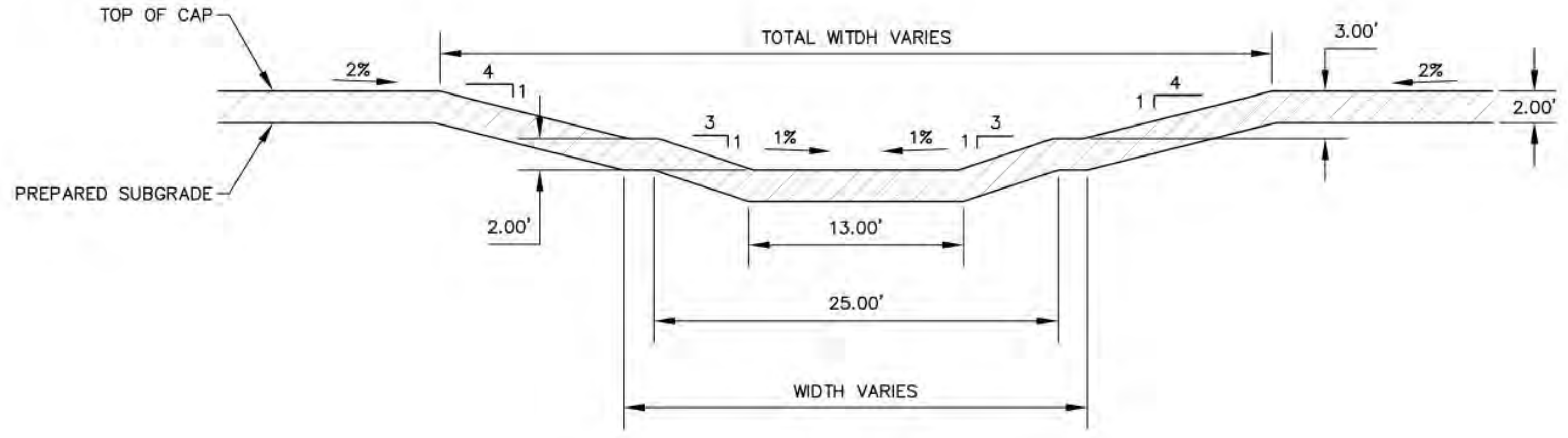
3 TRIBUTARY CHANNEL SECTION
63|73

NOT TO SCALE



4 ACCESS ROAD
63|73

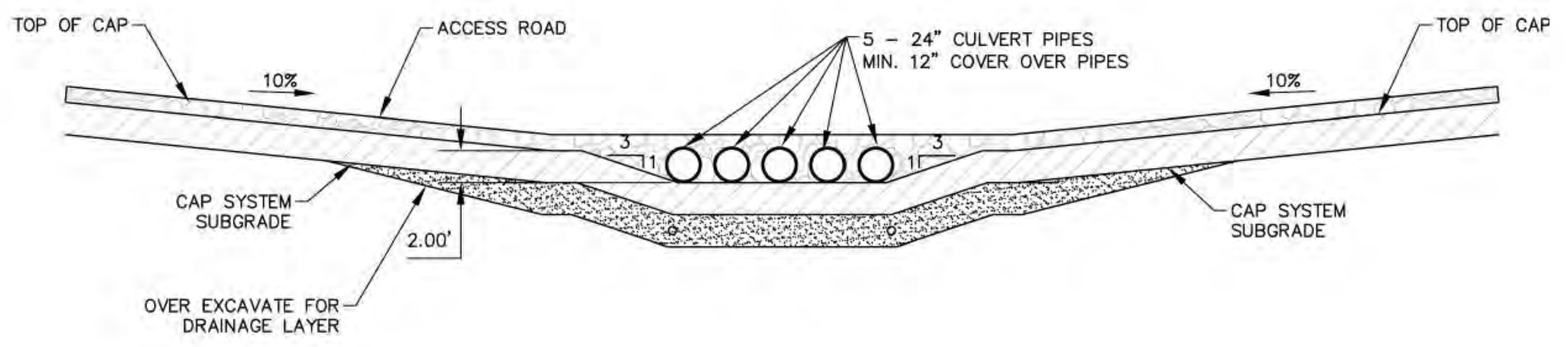
NOT TO SCALE



5 MAIN CHANNEL SECTION
63|73

NOT TO SCALE

REACH	TOTAL CHANNEL WIDTH	TOTAL CHANNEL DEPTH	2-YEAR STORM FLOW DEPTH	25-YEAR STORM FLOW DEPTH	100-YEAR STORM FLOW DEPTH
REACH A	95	5 FT.	1.1 FT.	3.0 FT.	3.7 FT.
REACH B	85	5 FT.	1.2 FT.	3.2 FT.	3.8 FT.
REACH C	74	5 FT.	1.3 FT.	3.3 FT.	3.8 FT.
REACH D	62	5 FT.	1.4 FT.	3.3 FT.	3.8 FT.



6 CHANNEL ACCESS ROAD CROSSING
63|73

NOT TO SCALE

NOTES:
1. CULVERT PIPES TO BE CORRUGATED HDPE WITH SMOOTH INTERIOR (H-20 LOADING RATED).

DATE	NO.	DESCRIPTION	APPD.
1/30/15	B	REVISION BASED ON KENTUCKY DEP COMMENTS	
6/14/13	A	ISSUED FOR PERMIT – INITIAL SUBMITTAL	

REVISIONS

KENTUCKY POWER COMPANY

BIG SANDY PLANT

LOUISA KENTUCKY

CONSTRUCTION DETAILS

ATTACHMENT 20

DWG. NO. 13-30173-B

SCALE:	NTS
PROJECT NO:	13815151
DESIGNED BY:	LEC
DRAWN BY:	LEC
APPROVED BY:	TAK

1375 EUCLID AVENUE, SUITE 600
CLEVELAND, OHIO 44115

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 1/2 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

SCALE:
DR:
CH:
ENGR:
PROJ ENGR:
DATE:
APPROVED BY

CIVIL ENGINEERING DIVISION

Fig. 2C

AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

SYSTEM DATE- DD-MM-YYYY
SYSTEM TIME- HOUR:MINUTE

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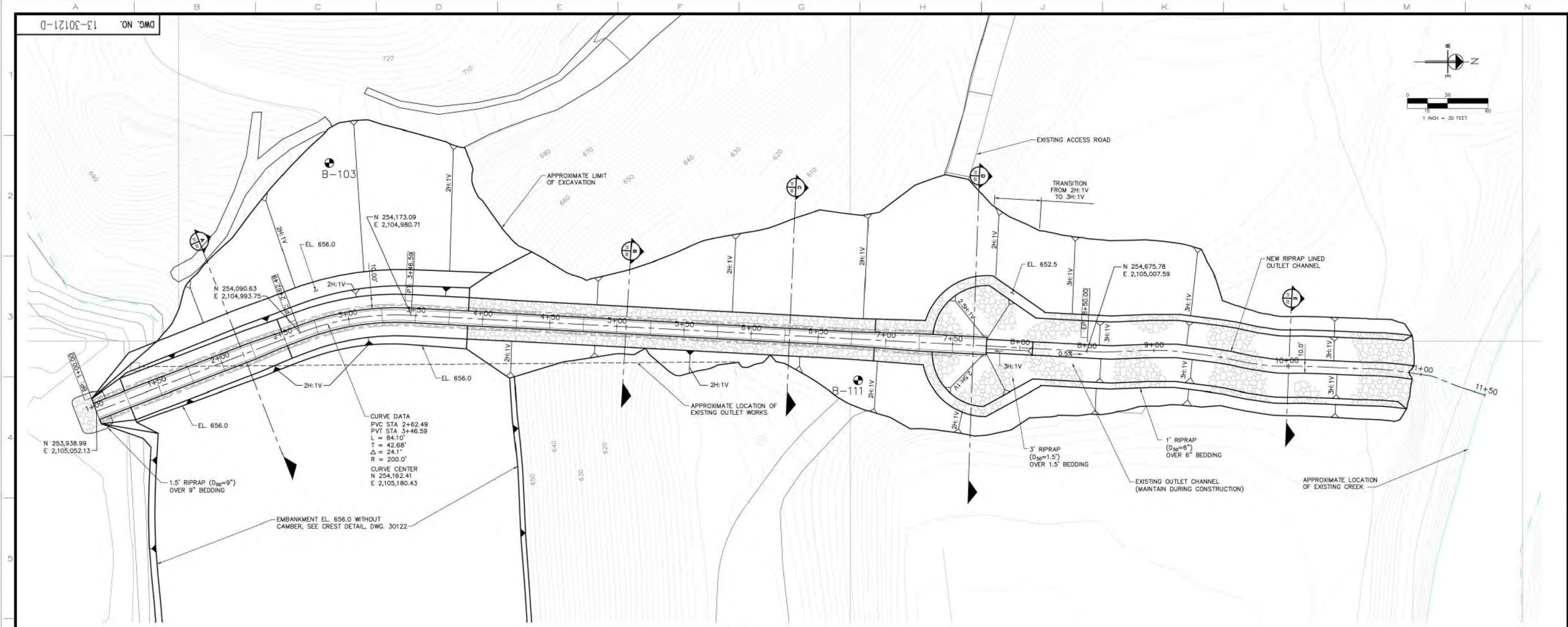
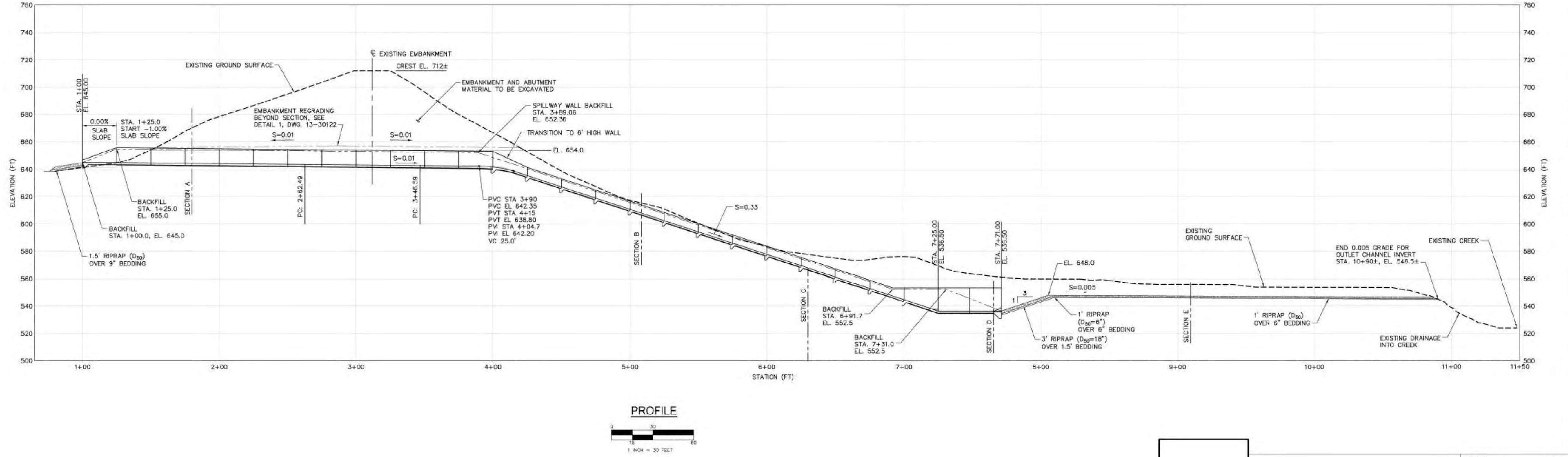


PLAN



PROFILE

LEGEND

● BORING

DATE	NO.	DESCRIPTION	APPD.
06/05/13	D	100% SUBMITTAL–URS	
04/26/13	C	90% SUBMITTAL–URS	
02/20/13	B	70% SUBMITTAL–URS	
12/03/12	A	30% SUBMITTAL–URS	

REVISIONS

KENTUCKY POWER COMPANY

BIG SANDY PLANT

LOUISA KENTUCKY

SPILLWAY
PLAN AND PROFILE

DWG. NO. 13-30121-D

SCALE:
DR:
CH:
ENGR:
PROJ. ENGR:
DATE:
APPROVED BY
CIVIL ENGINEERING DIVISION

Fig. 2D

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

SCALE:	1"=30'
PROJECT NO:	13815151
DESIGNED BY:	CJY
DRAWN BY:	WDH
APPROVED BY:	TAK

URS

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 1/2 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

SYSTEM DATE– DD–MM–YYYY
SYSTEM TIME– HOUR:MINUTE

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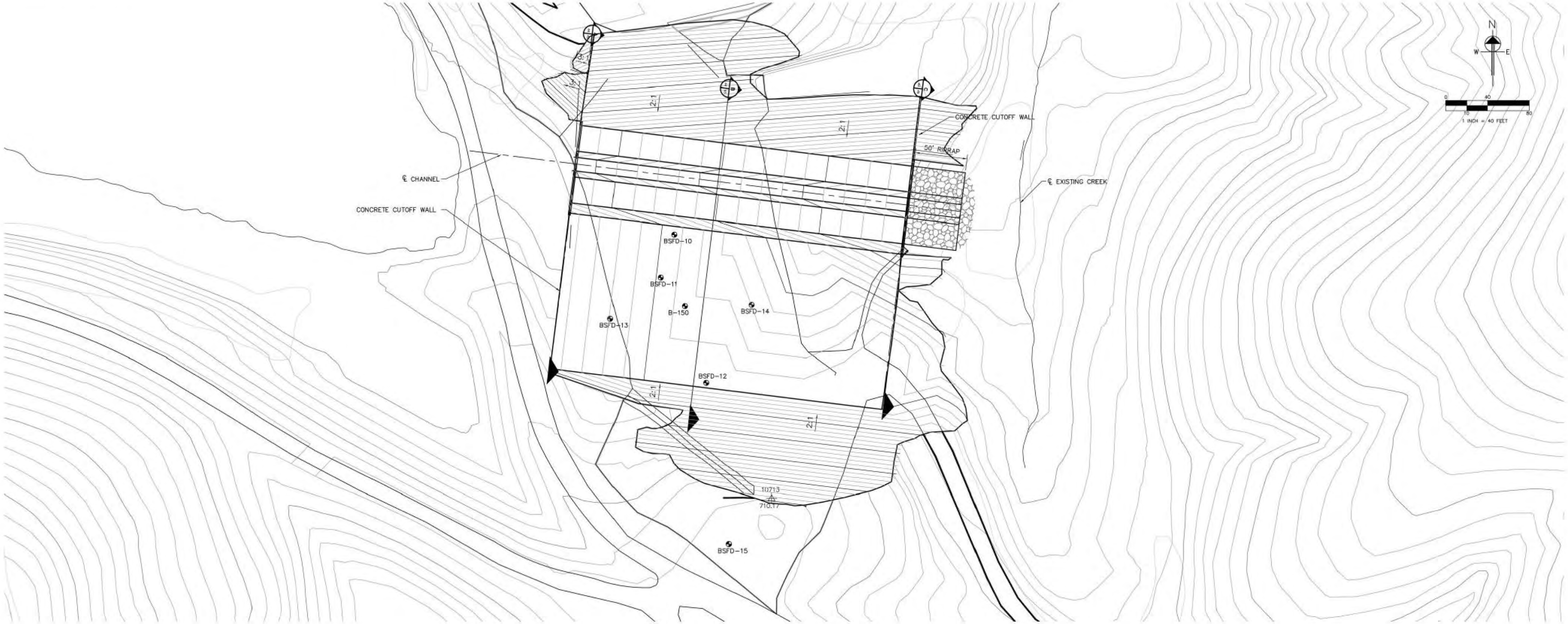
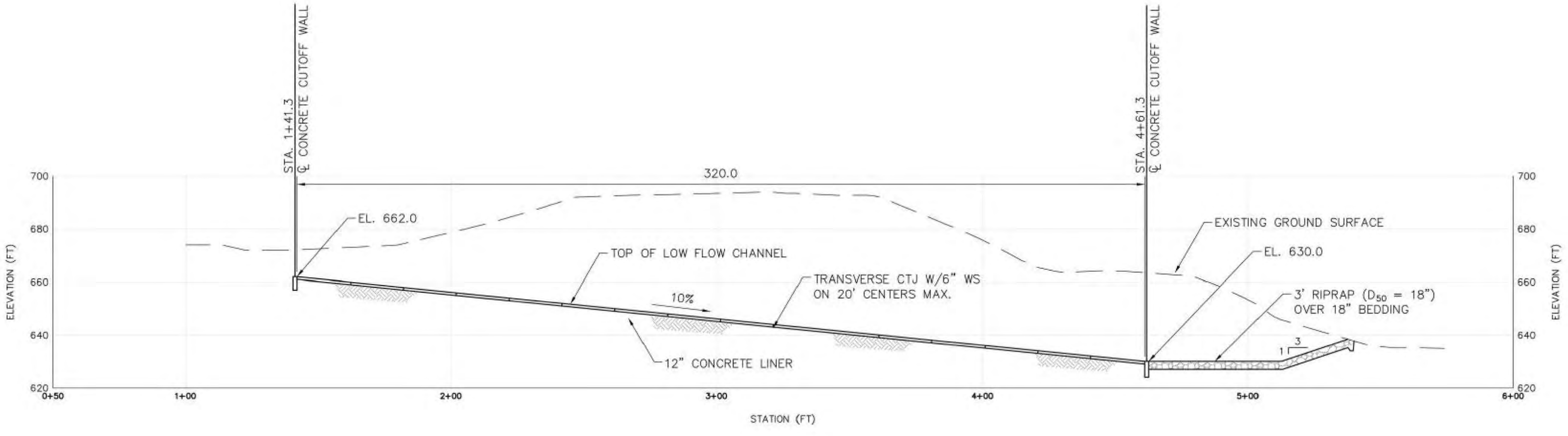
DWG. NO. 13-30144-D



PLAN

LEGEND

● BORING



PROFILE

0 10 20 40
1 INCH = 20 FEET

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04/26/13	C	90% SUBMITTAL-URS	
02/20/13	B	70% SUBMITTAL-URS	
12/03/12	A	30% SUBMITTAL-URS	

REVISIONS

KENTUCKY POWER COMPANY

BIG SANDY PLANT

LOUISA KENTUCKY

SADDLE DAM OUTLET
PLAN AND PROFILE

DWG. NO. 13-30144-D

SCALE:
DR:
CH:
ENGR:
PROJ. ENGR:
DATE:
APPROVED BY

CIVIL ENGINEERING DIVISION

Fig. 2E

AMERICAN ELECTRIC POWER

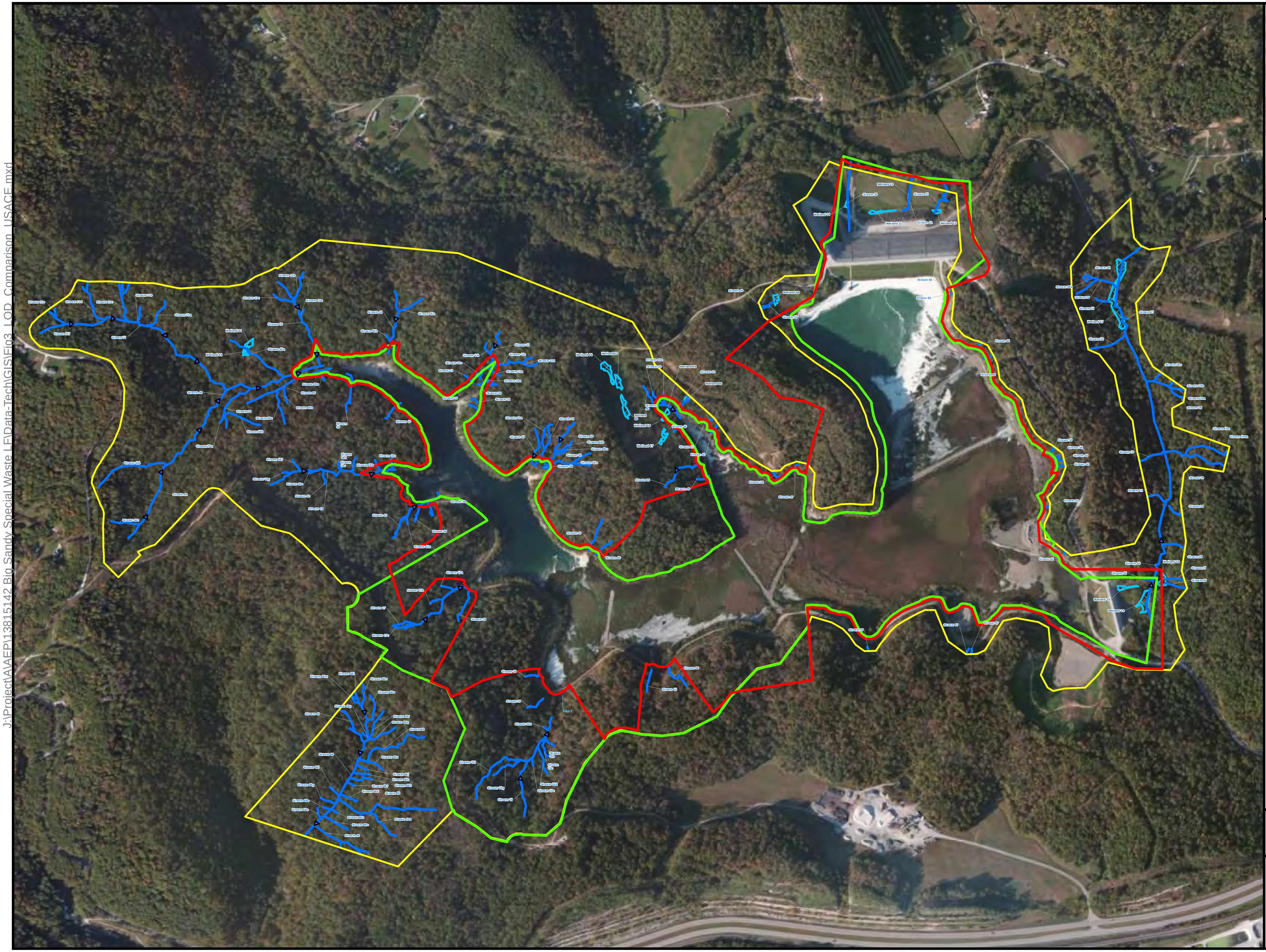
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

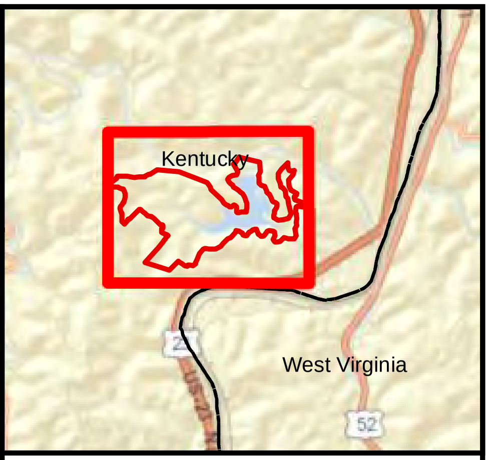
SYSTEM DATE- DD-MM-YYYY
SYSTEM TIME- HOUR:MINUTE

SCALE:	1" = 20'
PROJECT NO:	13815151
DESIGNED BY:	CJY
DRAWN BY:	WDH
APPROVED BY:	TAK

URS

BAR IS ONE-INCH ON ORIGINAL DRAWING
1/2 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY





N

LEGEND

- 🟥 Current Limit of Disturbance
- 🟩 July 2014 Limit of Disturbance
- 🟨 April 2013 Limit of Disturbance
- ▨ Delineated Wetland
- ■ Delineated Pond
- — Delineated Stream

0 750 1,500

Scale in Feet

Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX,

Big Sandy Fly Ash Pond Closure

FIGURE 3
LIMIT OF DISTURBANCE
COMPARISON MAP

JOB NO. 13815142

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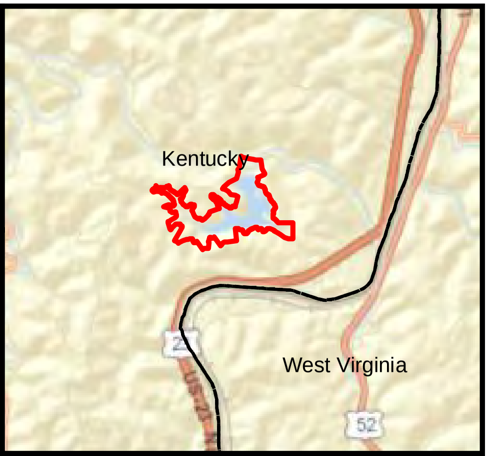

N

LEGEND

- 🟥 Project Limit of Disturbance
- ▨ Delineated Wetland
- 🟦 Delineated Pond
- — Delineated Stream

0 1,000 2,000

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online USA Topo Map
Fallsburg. KY; Prichard, KY
7.5' USGS Topographic Quadrangles

Big Sandy Fly Ash
Pond Closure

FIGURE 4
WETLAND DELINEATION AND STREAM ASSESSMENT MAP

JOB NO. 13815142

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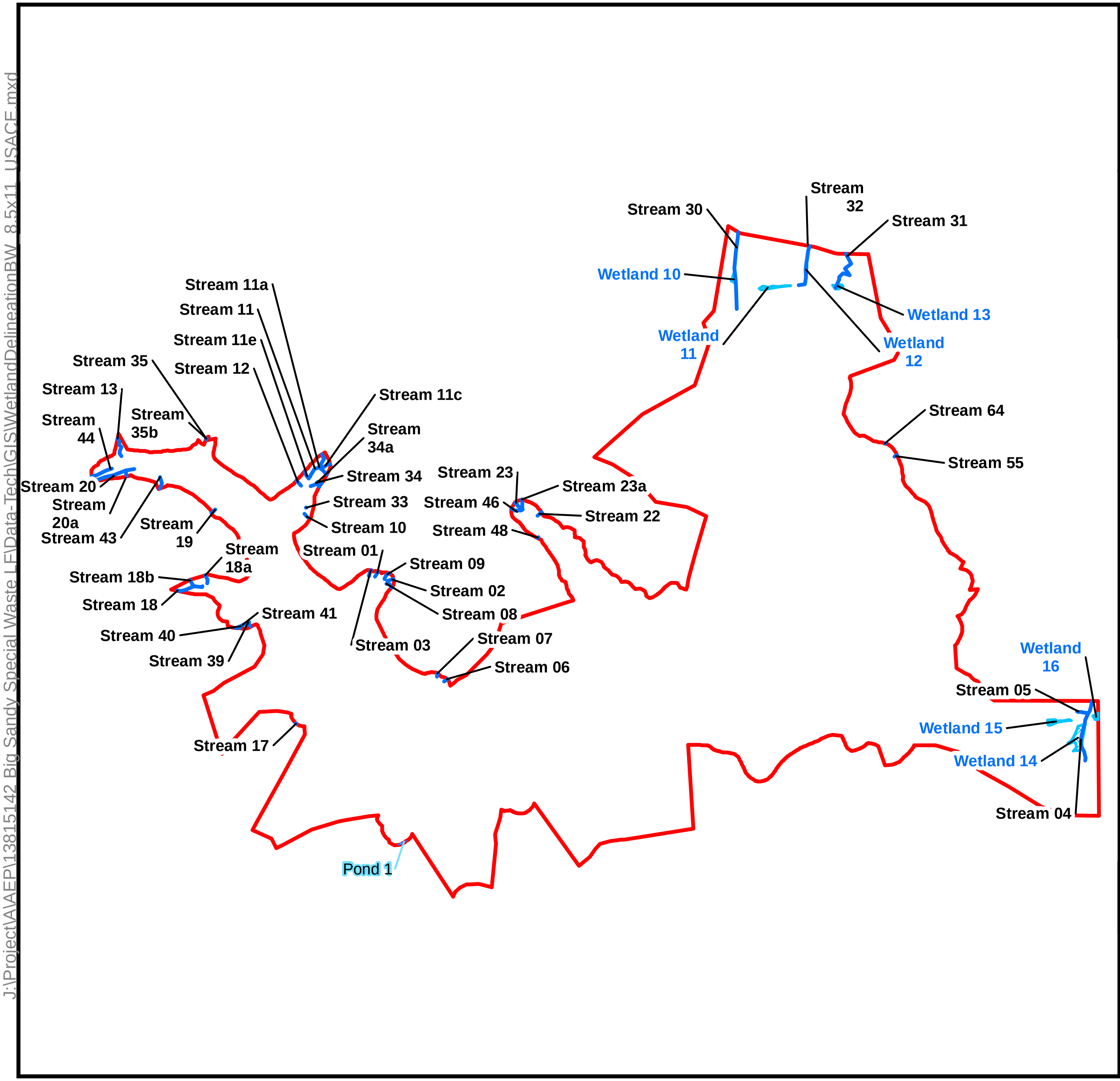

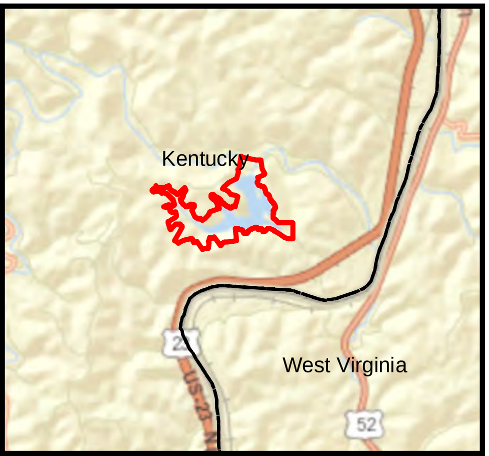

N

LEGEND

- 🟥 Project Limit of Disturbance
- ▨ Delineated Wetland
- 🟦 Delineated Pond
- — Delineated Stream

0 1,000 2,000

Scale in Feet

AEP

Big Sandy Fly Ash
Pond Closure

FIGURE 5
WHITE BACKGROUND MAP

JOB NO. 13815142

URS

J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\WetlandDelineationBW_8.5x11_USACE.mxd

BIG SANDY FLY ASH
POND CLOSURE PROJECT

WETLAND DELINEATION AND STREAM ASSESSMENT REPORT

Prepared for:
American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215

AEP AMERICAN® ELECTRIC POWER

URS

525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

May 2013

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

LIST OF ACRONYMS and ABBREVIATIONS

AEP	American Electric Power, Incorporated
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GPS	Global Positioning System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland
OHWM	Ordinary high water mark
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PHWH	Primary Headwater Habitat
PSS	Palustrine scrub/shrub
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

Kentucky Power Company, a unit of American Electric Power (AEP), is proposing to permanently close the Big Sandy Fly Ash Pond located in Lawrence County, Kentucky. AEP owns and operates the 1,097 MW Big Sandy Plant on the west bank of the Big Sandy River near Louisa, Kentucky. Currently, coal combustion fly ash from the plant is disposed in the Big Sandy Fly Ash reservoir, which is impounded by the Horseford Creek Dam located approximately 0.75-mile northwest of the plant. In expectation of future Federal Regulations pertaining to wet ash impoundments, AEP is proposing the design closure of the Plant’s 130 acre wet fly ash impoundment; which is referred to as the Big Sandy Fly Ash Pond Closure Project (“Project”). AEP is proposing the completion of the Project since the fly ash pond will no longer be needed for wet sluice disposal beginning in 2016. It is AEP’s desire to permanently close the facility by draining and capping the Big Sandy Fly Ash Pond. The lead federal agency for the Project is the United States Army Corps of Engineers, Louisville District (USACE). An overview of the wetland delineation limits for the proposed Project is illustrated on Figure 1.

Land uses within 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: wooded uplands (young to mature oak-mixed mesophytic forests and young maple-mixed mesophytic forests), wetlands, and fly ash pond. Wooded uplands are the most dominant land use along the Project.

2.0 METHODOLOGY

The purpose of the field survey was to assess whether wetlands and other “waters of the U.S.” exist within the approximately 602 acre 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 part of the process to determine the occurrence and location of potential wetland areas.

In May, June, and October 2012, URS biologists walked the Project study area to conduct a wetland delineation and stream assessment. The study area was determined by using the approximate limit of disturbance for the pond closure excavation activities.

During field surveys, the physical boundaries of observed water features were recorded using sub-meter 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.

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 URS 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 URS.

2.1 WETLAND DELINEATION

The Project survey area 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: Eastern Mountains and Piedmont Region (Version 2.0)* (*Regional Supplement*) (USACE, 2012). The *Regional Supplement* was released in April 2012 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 any of the identified wetlands, URS 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. The results of the wetland delineation are presented in Section 3.1 and completed USACE forms recorded for delineated wetlands at the site are provided in Appendix A.

2.1.1 SOILS

Soils were examined using a spade 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). In sandy soils, mottled soils with a matrix chroma of three or less, or unmottled soils with a matrix chroma of two or less are considered to be hydric soils.

Seven map units from one soil series and three soil series complexes are mapped within the Project survey area (USDA, 2013). Table 1 provides a list of these soil map units along with their basic attributes.

According to the *Web Soil Survey* (USDA, 2013) and the NRCS Hydric Soils List of Kentucky, there are no soil map units within the Project survey boundary listed as containing any hydric component.

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 did not identify any growing season records for Lawrence County. The nearest county to the Project area, Boyd County, was identified with data indicating that in an average year, this period lasts from April 18 to October 22, or 187 days. Based on this information it is estimated that in the Project area, five percent of the growing season equates to approximately 9 days.

The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed hydrological data. 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, 2011).

Review of USGS watershed data indicates that the Project is located within the Big Sandy River watershed (USGS, 2012). Within the Big Sandy River watershed, the Project study area is also within two minor watersheds; Blaine Creek and Big Sandy River.

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 *2012 National Wetland Plant List: Eastern Mountains and Piedmont Region,* which encompasses the area of the Project. 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 are 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, 2012). Table 2 lists the vegetation that was identified in delineated wetlands during field surveys.

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). All identified wetlands within the survey area were classified as freshwater, Palustrine systems, which include all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. Three Palustrine wetland classes were identified within the Project survey area. The three classes are as follows:

- ***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 3 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.

2.1.5 OHIO RAPID ASSESSMENT METHOD V. 5.0

Since Kentucky does not have a functional assessment protocol for evaluating wetlands, the USACE Louisville district requested that URS ecologists follow the Ohio Environmental Protection Agency (Ohio EPA) Ohio Rapid Assessment Method for Wetlands v. 5.0 (ORAM). The ORAM method was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under 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 Ohio EPA, 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). The ORAM scores for the wetlands that were delineated are discussed in Section 3.1.4 of this report.

Category 1 Wetlands

Category 1 wetlands support minimal wildlife habitat, hydrological and recreational functions, and typically 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 STREAM ASSESSMENTS

Streams were identified by the presence of a defined bed and bank, and evidence of an ordinary high water mark (OHWM). As defined in Title 33 Code of Federal Regulations (CFR) 328.3(e), the term OHWM means 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 area (33 CFR 328.3e, 1993). Although not exhaustive, USACE Regulatory Guidance Letter No. 05-05 (RGL05-05) identifies 15 characteristics of a OHWM such as natural line impressed on the bank, shelving, changes in the soil character, scour and several other indicators (USACE, 2005). RGL05-05 recommends that two or more characteristics be used to make the OHWM determination unless there is particularly strong evidence for one.

Stream assessments were conducted using the methods described in the USACE's *Operational Draft Regional Guidebook for the Functional Assessment Of High-Gradient Ephemeral And Intermittent Headwater Streams In Western West Virginia And Eastern Kentucky* (USACE, 2010) and the U.S. EPA's *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition* (Barbour et al. 1999).

2.2.1 USACE FUNCTIONAL ASSESSMENT OF HIGH-GRADIENT EPHEMERAL AND INTERMITTENT HEADWATER STREAMS IN WESTERN WEST VIRGINIA AND EASTERN KENTUCKY

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 streams located within the Project area were evaluated using the USACE's *Operational Draft Regional Guidebook for the Functional Assessment Of High-Gradient Ephemeral And Intermittent Headwater Streams In Western West Virginia And Eastern Kentucky* (USACE, 2012). This Regional Guidebook indicates the objective of this method is to meet the needs of federal and state agencies for a procedure to assess potential impact and mitigation reaches of streams in eastern Kentucky and western West Virginia.

This assessment method relies on 11 variables to assess the functions of headwater streams within eastern Kentucky and western West Virginia that include channel canopy cover, channel substrate embeddedness, channel substrate size, potential channel bank erosion, large woody debris, riparian/buffer zone tree diameter, riparian/buffer zone snag density, riparian/buffer zone sapling/shrub density, riparian/buffer zone species richness, riparian/buffer zone soil detritus, riparian/buffer zone herbaceous cover, and watershed land-use.

The objective of the stream analysis is to create baseline conditions of the function of the streams within an area and to be able to compare the difference between pre-project and post-project conditions. This functional difference represents the potential loss or gain of functional capacity of the streams as a result of the Project.

Completed USACE high-gradient ephemeral and intermittent headwater stream forms are provided in Appendix C. Results of the high-gradient ephemeral and intermittent headwater stream assessments are discussed in Section 3.2.1 of this report.

2.2.2 U.S. EPA RAPID BIOASSESSMENT PROTOCOLS FOR USE IN STREAMS AND WADEABLE RIVERS

Streams within the Project survey corridor that were identified as perennial, containing substrate dominated by 50 percent or greater bedrock within the stream reach, containing major hydrologic inputs from groundwater, or an estimated gradual slope of four percent or less were not evaluated using the USACE's Functional Assessment of High-Gradient Ephemeral and Intermittent streams since the methodology was not intended for assessment of these types of streams. The stream assessment for these streams was conducted using the methods described in the U.S. EPA's *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition* (Barbour et al. 1999). The protocols include a method for habitat assessment that is calibrated to the stream's biological condition, which is abbreviated as the "HABSCORE". The HABSCORE is an independent, non-invasive, repeatable procedure for statistically defensible biological surveys. It provides a method to assess the quality of instream and riparian habitat. The assessed stream locations within the Project survey area are included on Figures 3A and 3K.

HABSCORE relies on visual observations of 10 parameters including substrate type, embeddedness, sediment deposition, water velocity, flow status, channel alteration, general morphology, bank stability, riparian zone vegetation quantity and width to provide an overall assessment of the sampling site. The 200-point system is broken down into four categories: Optimal (160-200), Sub-Optimal (110-159), Marginal (60-109), and Poor (<60). The form includes nonparametric factors for basic water quality measurements, dominant plant species, land uses, non-point sources of pollution, woody debris, sediment odors, presence of oils and black deposits, among others. The protocols also distinguish between high-gradient and low-gradient streams with different forms for each. Results of the rapid bioassessment are discussed in Section 3.2.2 of this report

3.0 RESULTS

Within the 602 acre Project study area, URS delineated 17 wetlands, 154 streams, and one pond. The delineated wetlands and other water features are discussed in detail in the following sections.

3.1 WETLAND DELINEATION

The locations, approximate extents, and acreages of the wetlands delineated within the Project survey area are shown on Figures 3A and 3K. Completed USACE wetland delineation forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix E1.

3.1.1 Preliminary Soils Evaluation

According to the USDA/NRCS Web Soil Survey of Lawrence County, Kentucky (USDA 2013) and the NRCS Hydric Soils List of Kentucky, one soil series and three soil series complexes are mapped within the Project survey area. No soil series within the Project survey area was identified with any hydric soil map units (NRCS, 2012). Soils in each wetland were observed and documented as part of the delineation methodology. Soil series located within the Project survey area are shown on Figures 2. Table 1 provides a detailed overview of all soil series within the Project survey area.

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 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 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 maps of the Fallsburg and Prichard, Kentucky quadrangles, the Project survey area contains three mapped NWI wetlands: one Palustrine Emergent Persistent Semi-permanently Flooded Diked/Impounded wetland (PEM1Fh), one Lacustrine Limnetic Unconsolidated Bottom Permanently Flooded Diked/Impounded (L1UBHh) feature, and one Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded (PUBHh) wetland (USFWS, 2012). Summary information on NWI mapped wetlands is presented in Table 3 and shown on Figure 2.

3.1.3 Delineated Wetlands

The delineation identified a total of 17 wetlands, totaling 1.64 acres, within the Project survey area as shown in Table 4. The 17 wetlands are of three different wetland habitat types: 11 PEM wetlands, five PEM/PSS wetlands, and one PFO wetland. See Table 3.1.3 for a summary of the delineated wetlands.

The locations, approximate extents, and acreages of the wetlands identified within the survey areas are shown on Figures 3A and 3K. Completed USACE wetland delineation forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix E1.

TABLE 3.1.3
SUMMARY OF DELINEATED WETLANDS WITHIN THE BIG SANDY POND CLOSURE PROJECT SURVEY AREA

Cowardin Wetland Type[a]	ORAM Category 1	ORAM Category 2	ORAM Category 3	Number of Wetlands	Acreage within Survey Corridor
PEM	11	0	0	11	0.65
PEM/PSS	2	3	0	5	0.44
PFO	0	1	0	1	0.55
Total	**13**	**4**	**0**	**17**	**1.64**

Cowardin Wetland Type[a] : PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested

3.1.4 Delineated Wetlands ORAM V5.0 Results

Within the Project survey area, 13 of the 17 wetlands are Category 1 wetlands, while the remaining four wetlands are Category 2 wetlands. No Category 3 wetlands were identified within the Project survey area. Wetland 15 had the lowest ORAM score, 21.5, while Wetland 14 had the highest score, 47. Completed ORAM forms for the wetlands are provided in Appendix B.

Category 1 Wetlands

Thirteen Category 1 wetlands, totaling 0.75 acre, were delineated within the Project survey area. The Category 1 wetlands were identified as 11 PEM wetlands (0.65 acre) and two PEM/PSS wetlands (0.12 acre). The highest Category 1 ORAM score was 29 (Wetland 13), and the lowest ORAM score was 21.5 (Wetland 15). These wetlands typically exhibited narrow upland buffers and intensive use of adjacent upland areas (fly ash pond), exhibited limited plant community development with a moderate to high percentage of invasive species, and characteristically had habitat and hydrology in the early stages of recovering from previous manipulation because of farming or other disturbances.

Category 2 Wetlands

Four Category 2 wetlands, totaling 0.87 acre, were delineated within the Project survey area. The four Category 2 wetlands were identified as three PEM/PSS wetlands (0.32 acre) and one

PFO wetland (0.55 acre). The highest scoring Category 2 wetland was 47 (Wetland 14), and the lowest was 32.5 (Wetland 16). The Category 2 wetlands generally exhibited fair to moderate plant communities with few invasive species, low to moderate plant community interspersion, low to high intensity surrounding land use (e.g. young second growth woodlots, shrub-land, etc.), and recovering and/or recovered natural hydrology and habitat.

Category 3 Wetlands

No Category 3 wetlands were delineated within the Project survey area.

3.2 DELINEATED STREAMS

URS identified 154 streams, totaling 42,420 linear feet, within the Project survey area as listed in Table 5. The locations of streams identified within the survey area are shown on Figures 3A through 3K. See Table 3.2 for a summary of the delineated streams.

The 154 streams assessed are composed of 136 ephemeral streams, 15 intermittent streams, and three perennial streams. Eleven streams were assessed using the U.S. EPA's RBA methodology, while the remaining 143 were assessed using the USACE HGM methodology (high gradient ephemeral and intermittent streams).

Review of USGS watershed data indicates that the Project is located within the Big Sandy River watershed (USGS, 2012). Within the Big Sandy River watershed, the Project study area is also within two minor watersheds; Blaine Creek and Big Sandy River.

Most assessed streams within the survey area appear to be tributaries that flow into or combine with other streams (waters of the U.S) and connect to Blaine Creek below the fly ash pond. A small area located at the southwest corner of the survey area contains tributaries that flow directly into the Big Sandy River.

TABLE 3.2
SUMMARY OF DELINEATED STREAMS WITHIN THE BIG SANDY POND CLOSURE PROJECT SURVEY AREA

Flow Type	RBA Assessed Streams	High Gradient Stream Assessed Streams	Number of Streams	Linear Feet within Survey Area
Ephemeral	1	135	136	25,696
Intermittent	7	8	15	12,406
Perennial	3	0	3	4,318
Total	**11**	**143**	**154**	**42,420**

3.2.1 Functional Assessment Of High-Gradient Ephemeral And Intermittent Headwater Streams In Western West Virginia And Eastern Kentucky

Within the Project survey area, 143 streams were evaluated using the Functional Assessment of High-Gradient Ephemeral and Intermittent Headwater Streams in western West Virginia and eastern Kentucky method. The overall landscape and habitat functions of various streams within the Project survey area were observed having comparable resemblance in various areas of the property. Based on the landscape and habitat evaluation conducted by URS during the field survey, it was determined that seven separate stream habitat areas (SHA) exist within the Project survey area. The stream habitat area groupings were developed based on observed differences in habitat including topography, geology, slope, streamflow, and biological characteristics.

Stream Habitat Area 1: There are 20 streams within SHA 1. The canopy of SHA 1 is completely closed to partially open from the mature trees that surround the streams. There is also very little understory growth and very little to no herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most streams assessed in this location were on gentle slopes near the confluence with the main channel.

Stream Habitat Area 2: There are 10 streams within SHA 2. Most streams assessed in this location were on steep slopes that originate near the top of the ridge and extend downstream to where the hillside has been cut out for the perimeter road around the fly ash pond. The canopy of SHA 2 is completely closed near the top of the hill; however, there is less canopy cover at the downhill extents due to the fly ash pond. There is also little to moderate understory growth and very little herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. The streams do not directly connect to the fly ash pond.

Stream Habitat Area 3: There are 12 streams within SHA 3. Most streams assessed in this location were on steep slopes that appear to have been modified through tree removal, cut/fill material and landslides. The canopy of SHA 3 is completely open near the top of the streams, however, there is more canopy cover within the downhill extents due to the lack of clearing. There is moderate to heavy understory growth and moderate to heavy herbaceous growth. Most of the substrate was comprised of sand, silt, and some gravel.

Stream Habitat Area 4: There are 25 streams within SHA 4. The canopy of SHA 4 is completely closed to partially open from the mature trees that surround the streams. There is also very little understory growth and very little to no herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most streams assessed in this location of the property originate near the ridge tops and extend down to the fly ash pond.

Stream Habitat Area 5: There are 29 streams within SHA 5. The canopy of SHA 5 is completely closed to partially open from the mature trees and understory that surround the streams. There is moderate to thick understory growth from what appears to be previous logging or other disturbances, and little herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most streams assessed in this location of the property originate near the ridge tops and extend down to intermittent streams, perennial streams, or the fly ash pond.

Stream Habitat Area 6: There are 23 streams within SHA 6. Most streams assessed in this location were on steep slopes that originate near the top of the ridges and extend downstream to where the hillsides have been cut out for the perimeter road around the fly ash pond. The canopy of SHA 6 is completely closed near the top of the hillsides, however, there is less canopy cover at the downhill extents due to the fly ash pond. This part of the property appears to have undergone some selective logging within the past 20-40 years and has created moderate to thick understory growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most of the streams do not directly connect to the fly ash pond.

Stream Habitat Area 7: There are 24 streams within SHA 7. Most streams assessed in this location were on steep slopes that originate near the top of benches or ridges and extend downstream to a perennial stream. The canopy of SHA 7 is completely closed due to the mature forest. There is little to no understory growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Near the confluence with the main channel, most streams had some larger substrate.

A form representing each of the stream habitat areas assessed using the Functional Assessment of High-Gradient Ephemeral and Intermittent Headwater Stream method is provided in Appendix C. Color photographs were taken of a representative sample of the streams during the field survey and are provided in Appendix E2.

3.2.2 Rapid Bioassessment Protocols For Use In Streams And Wadeable Rivers

Eleven streams were assessed using the U.S. EPA's Rapid Bioassessment method within the approximately 602-acre Project survey area. Field surveys within the Project survey area indicated these 11 streams, totaling 13,171 linear feet, were classified as one Optimal stream, four Sub-Optimal streams, and six Marginal streams. The designations for each of these stream types are described below.

A Rapid Bioassessment form for each stream is provided in Appendix D. Color photographs were taken of each stream during the field survey and are provided in Appendix E2.

Poor Streams – No Poor streams were identified within the survey area.

Marginal Streams – Six Marginal streams, totaling 5,580 linear feet, were identified during the field investigations and have scores that range between 62 (Stream 32) and 103 (Stream 4). The Marginal streams located within the Project survey area consisted of one ephemeral stream, four intermittent streams, and one perennial stream. The substrates of these streams were generally dominated by gravel and silt, with lesser amounts of cobble and boulder. The streams showed evidence of moderate epifaunal substrate, low pool variability, channel alteration, and a small riparian vegetative zone.

Sub-Optimal Streams – Four Sub-Optimal streams, totaling 6,210 linear feet, were identified during the field investigations and have scores that range between 112 (Stream 18) and 144 (Stream 15). The Sub-Optimal streams consisted of three intermittent streams and one perennial stream. The substrates of these streams were generally dominated by cobble, gravel, and boulder, with lesser amounts of sand, silt, and clay. The streams showed evidence of good epifaunal substrate, good pool variability, minimal channel alteration, good amount of riffles, and a riparian vegetative zone.

Optimal Streams – One Optimal stream totaling 1,381 linear feet was identified during the field investigations. Stream 68 is a perennial stream that received a score of 167. The substrate of the stream was generally dominated by boulder, cobble, gravel, with lesser amounts of bedrock and sand. The stream showed evidence of good epifaunal substrate, good pool variability, no channel alteration, good amount of riffles, and a riparian vegetative zone.

3.3 DELINEATED PONDS

One pond totaling 0.24 acre was identified within the Project survey area (Table 6). The pond appears to be man-made and used for stormwater control. The location of the pond identified within the Project survey area is shown on Figure 3I. A representative color photograph was taken of the pond during the field survey and is provided in Appendix E3.

4.0 SUMMARY

The delineation of the approximately 602 acre Project survey area identified a total of 17 wetlands, totaling 1.64 acres. The 17 wetlands are of three different wetland habitat types: 11 PEM wetlands, five PEM/PSS wetlands, and one PFO wetland. Of these wetlands, 13 wetlands are Category 1 wetlands and four wetlands are Category 2 wetlands. No Category 3 wetlands were identified within the Project survey boundary.

Field surveys identified 154 streams within the Project survey area totaling approximately 42,420 linear feet. The 154 streams were composed of 136 ephemeral streams, 15 intermittent streams, and three perennial streams. Eleven streams were assessed using the U.S. EPA's RBA methodology, while the remaining 143 were assessed using the USACE's Functional Assessment of High-Gradient Ephemeral and Intermittent Headwater Streams.

One pond totaling 0.24 acre was identified within the Project survey area and appears to be man-made for stormwater control use.

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TABLE 1

SOIL MAP UNITS AND DESCRIPTIONS FOR THE BIG SANDY FLY ASH POND CLOSURE PROJECT SURVEY AREA

Soil Series	Symbol	Map Unit Description	Percent of Survey Area by Series	Topographic Setting	Hydric	Hydric Component (%)
Dumps	Dm	Dumps, mine; tailings; and tipples	26	Flyash pond	Not hydric	N/A
Grigsby	Gf	Grigsby fine sandy loam, frequently flooded	1	Floodplain	Not hydric	N/A
Shelocta	ShF	Shelocta-Hazleton-Fedscreek complex, 30 to 60 percent slopes, stony	7	Hillslopes	Not hydric	N/A
Upshur	UpD	Upshur-Rarden complex, 12 to 25 percent slopes	3	Hillslopes	Not hydric	N/A
	UpF	Upshur-Rarden complex, 25 to 60 percent slopes, rocky	25	Hillslopes	Not hydric	N/A
Vandalia	VaF	Vandalia-Beech complex, 20 to 60 percent slopes, stony	36	Hillslopes	Not hydric	N/A
	VaF2	Vandalia-Beech complex, 20 to 60 percent slopes, stony, eroded	2	Hillslopes	Not hydric	N/A

NOTES:

(1) Data sources include:

USDA, NRCS. 2013 Soil Survey Geographic (SSURGO) Database. Avialable online at: http://soildatamart.nrcs.usda.gov/

USDA, NRCS. April 2012. National Hydric Soils List by State. Available online at: http://soils.usda.gov/use/hydric/lists/state.html

TABLE 2

VEGETATION IDENTIFIED WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT DELINEATED WETLANDS

Common Name	Scientific Name	Stratum[a]	Eastern Mountains and Piedmont Supplement Indicator Status[b]
Allegheny Blackberry	*Rubus allegheniensis*	S	FACU
American Elm	*Ulmus americana*	T	FACW
American Sycamore	*Platanus occidentalis*	S & T	FACW
Beggarticks sp.	*Bidens* spp.	H	FAC
Black Willow	*Salix nigra*	S & T	OBL
Broad-Leaf Cat-Tail	*Typha latifolia*	H	OBL
Canadian Goldenrod	*Solidago canadensis*	H	FACU
Common Boneset	*Eupatorium perfoliatum*	S	FACW
Common Fox Sedge	*Carex vulpinoidea*	H	OBL
Cottongrass Bulrush	*Scirpus cyperinus*	H	FACW
Creeping-Jenny	*Lysimachia nummularia*	H	FACW
Curly Dock	*Rumex crispus*	H	FAC
Dark-Green Bulrush	*Scirpus atrovirens*	H	OBL
Deer-Tongue Rosette Grass	*Dichanthelium clandestinum*	H	FAC
Green Ash	*Fraxinus pennsylvanica*	S & T	FACW
False Nettle	*Boehmeria cylindrica*	H	FACW
Hop Sedge	*Carex lupulina*	H	OBL
Japanese Stilt Grass	*Microstegium vimineum*	S	FAC
Knotty-Leaf Rush	*Juncus acuminatus*	H	OBL
Lamp Rush	*Juncus effusus*	H	FACW
Lesser Poverty Rush	*Juncus tenuis*	H	FAC
Little False Bluestem	*Schizachyrium scoparium*	H	FACU
Narrow-Leaf Cat-Tail	*Typha angustifolia*	H	OBL
Needle Spike-Rush	*Eleocharis acicularis*	H	OBL
Pennsylvania Smartweed	*Polygonum pensylvanicum*	H	FACW
Pointed Broom Sedge	*Carex scoparia*	H	FACW
Poison Ivy	*Toxicodendron radicans*	H	FAC
Purple-Stem American-Aster	*Symphyotrichum puniceum*	H	OBL
Red-Root Flat Sedge	*Cyperus erythrorhizos*	H	FACW
River Birch	*Betula nigra*	T	FACW
Sallow Sedge	*Carex lurida*	H	OBL
Seedbox	*Ludwigia alternifolia*	H	FACW
Sensitive Fern	*Onoclea sensibilis*	H	FACW
Silver Maple	*Acer saccharinum*	T	FACW
Single-Vein Sweetflag	*Acorus calamus*	H	OBL
Small-Spike False Nettle	*Boehmeria cylindrica*	H	FACW
Sphagnum Moss	*Sphagnum* spp.	H	NI
Spotted Touch-Me-Not	*Impatiens capensis*	H	FACW

TABLE 2

VEGETATION IDENTIFIED WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT DELINEATED WETLANDS

Common Name	**Scientific Name**	**Stratum**[a]	**Eastern Mountains and Piedmont Supplement Indicator Status**[b]
Spotted Trumpetweed	*Eutrochium maculatum*	H	FACW
Squarrose Sedge	*Carex squarrosa*	H	FACW
Swamp Rose	*Rosa palustris*	S	OBL
Sweet-Scented Joe-Pye-Weed	*Eutrochium purpureum*	H	FAC
White Grass	*Leersia virginica*	H	FACW
White Turtlehead	*Chelone glabra*	H	OBL
Yellow Bristle Grass	*Setaria pumila*	H	FAC

[a] H = herb, S = shrub or sapling, T = tree, V = vine

[b] Wetland Indicator Status

OBL - Obligate Wetland - Occurs almost always (99% probability) in wetlands
FACW - Facultative Wetlands - Usually occurs in wetlands (67 - 99% probability)
FAC - Facultative - Equally likely to occur in wetlands or non-wetlands (34 - 66% probability)
FACU - Facultative Upland - Usually occurs in non-wetlands (67 - 99% probability)
UPL - Obligate Upland - Occurs almost always in non-wetlands (99% probability)
NI - No Indicator - There is insufficient information on habitat preference

TABLE 3

NWI WETLANDS WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT SURVEY AREA

Wetland Type	NWI Code	NWI Habitat Type [1]	Total Number of Each Habitat Type	NWI Quadrangle
Freshwater Emergent Wetland	PEM1Fh	Palustrine Emergent Persistent Semipermanently Flooded Diked/Impounded	1	Fallsburg
Lake	L1UBHh	Lacustrine Limnetic Unconsolidated Bottom Permanently Flooded Diked/Impounded	1	Fallsburg
Freshwater Pond	PUBHh	Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded	1	Fallsburg
Total Number of NWI Wetlands = 3				

Total Number of PEM = 1, PFO = 0, PSS = 0, PUB = 1, R = 0, L = 1

NWI Habitat Type[1] : USFWS National Wetlands Inventory Classification De-coder: http://137.227.242.85/Data/interpreters/wetlands.aspx

TABLE 4

DELINEATED WETLANDS WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT SURVEY AREA

Wetland Name	Latitude	Longitude	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Survey Corridor
Wetland 01	38.185144	-82.65042	PEM/PSS	23	1	0.06
Wetland 02	38.184948	-82.650542	PEM	23	1	0.03
Wetland 03	38.184148	-82.64005	PEM	22	1	0.08
Wetland 04	38.184414	-82.640347	PEM	23	1	0.14
Wetland 05	38.18358	-82.639877	PEM	24	1	0.11
Wetland 06	38.185745	-82.637086	PEM/PSS	40	2	0.03
Wetland 07	38.182916	-82.638806	PEM	28.5	1	0.07
Wetland 08	38.18342	-82.638723	PEM	27.5	1	0.04
Wetland 09	38.185936	-82.635573	PEM/PSS	24	1	0.06
Wetland 10	38.187993	-82.633528	PEM	23	1	0.02
Wetland 11	38.187827	-82.632687	PEM	23	1	0.05
Wetland 12	38.188183	-82.631769	PEM	22	1	0.02
Wetland 13	38.187824	-82.631001	PEM	29	1	0.03
Wetland 14	38.179076	-82.625342	PEM/PSS	47	2	0.21
Wetland 15	38.179389	-82.625917	PEM	21.5	1	0.06
Wetland 16	38.179511	-82.624825	PEM/PSS	32.5	2	0.08
Wetland 17	38.185963	-82.625944	PFO	46	2	0.55
Total: 17	PEM: 11, PEM/PSS: 5, PFO:1					**1.64**

Cowardin Wetland Typea : PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested

TABLE 5
DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Waterbody	Flow Regime	Form Used[a]	Score[b]	Stream Quality or Habitat Area	Linear Feet within Survey Area
Stream 01	38.18278	-82.642085	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	402
Stream 01a	38.18292	-82.642209	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	176
Stream 02	38.182358	-82.641507	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	411
Stream 02a	38.182345	-82.641158	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	157
Stream 03	38.182731	-82.642327	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	313
Stream 04	38.179875	-82.625015	Tributary to Blaine Creek	Intermittent	RBA	103	Marginal	3,343
Stream 05	38.179566	-82.625246	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	70
Stream 06	38.180497	-82.640554	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	170
Stream 07	38.18074	-82.64076	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	278
Stream 08	38.182257	-82.642054	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	101
Stream 09	38.182792	-82.64174	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	479
Stream 09a	38.182594	-82.641687	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	119
Stream 09b	38.182694	-82.64161	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	194
Stream 10	38.183665	-82.644132	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	95
Stream 11	38.184825	-82.643639	Tributary to fly ash pond	Intermittent	HGS	NA	Area 4	491
Stream 11a	38.18441	-82.643544	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	117
Stream 11b	38.184944	-82.643781	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	104
Stream 11c	38.184638	-82.64308	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	381
Stream 11d	38.184545	-82.64252	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	129
Stream 11e	38.184364	-82.644005	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	62
Stream 12	38.184279	-82.644254	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	95
Stream 13	38.185593	-82.648905	Tributary to fly ash pond	Intermittent	RBA	96	Marginal	816
Stream 13a	38.185804	-82.648927	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	56
Stream 13b	38.186405	-82.648953	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	306
Stream 13c	38.186111	-82.649453	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	185
Stream 14	38.177507	-82.639347	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	183
Stream 15	38.17573	-82.642819	Tributary to fly ash pond	Intermittent	RBA	144	Sub-Optimal	895
Stream 15a	38.176481	-82.642261	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	47
Stream 15b	38.176163	-82.642182	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	104

TABLE 5
DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Waterbody	Flow Regime	Form Used[a]	Score[b]	Stream Quality or Habitat Area	Linear Feet within Survey Area
Stream 15c	38.176046	-82.642318	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	173
Stream 15d	38.175778	-82.642329	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	245
Stream 15e	38.175752	-82.642651	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	61
Stream 15f	38.175687	-82.643729	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	646
Stream 15g	38.175682	-82.643372	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	275
Stream 16	38.17767	-82.642599	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	132
Stream 17	38.179089	-82.645326	Tributary to fly ash pond	Intermittent	HGS	NA	Area 6	797
Stream 17a	38.179664	-82.644962	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	111
Stream 17b	38.179373	-82.645296	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	112
Stream 17c	38.178786	-82.646264	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	233
Stream 18	38.18225	-82.648104	Tributary to fly ash pond	Intermittent	RBA	112	Sub-Optimal	1,120
Stream 18a	38.182426	-82.64647	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	93
Stream 18b	38.182388	-82.646877	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	100
Stream 18c	38.182425	-82.647548	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	113
Stream 18d	38.182362	-82.647975	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	87
Stream 18e	38.182258	-82.648736	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	43
Stream 18f	38.182427	-82.64916	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	114
Stream 18g	38.182275	-82.649426	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	69
Stream 19	38.183625	-82.646425	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	182
Stream 20	38.184248	-82.649346	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	740
Stream 20a	38.184416	-82.648381	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	81
Stream 20b	38.183988	-82.649448	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	138
Stream 20c	38.183736	-82.64961	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	294
Stream 21	38.183258	-82.637508	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	84
Stream 22	38.183653	-82.63824	Tributary to fly ash pond	Intermittent	HGS	NA	Area 3	186
Stream 23	38.183783	-82.638926	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	165
Stream 23a	38.183776	-82.63877	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	77
Stream 24	38.181997	-82.635548	Tributary to fly ash pond	Ephemeral	RBA	67	Marginal	177
Stream 25	38.182203	-82.63839	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	415

TABLE 5
DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Waterbody	Flow Regime	Form Used[a]	Score[b]	Stream Quality or Habitat Area	Linear Feet within Survey Area
Stream 26	38.179403	-82.624443	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	178
Stream 27	38.179562	-82.624478	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	154
Stream 28	38.18034	-82.624501	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	185
Stream 29	38.180985	-82.624289	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	138
Stream 30	38.188125	-82.633499	Tributary to Blaine Creek	Perennial	RBA	89	Marginal	558
Stream 31	38.188061	-82.630791	Tributary to Blaine Creek	Intermittent	RBA	62	Marginal	371
Stream 32	38.188102	-82.631772	Tributary to Blaine Creek	Intermittent	RBA	80	Marginal	315
Stream 33	38.183828	-82.6441	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	64
Stream 34	38.184202	-82.643787	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	141
Stream 34a	38.184134	-82.643645	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	100
Stream 35	38.185591	-82.646285	Tributary to fly ash pond	Intermittent	HGS	NA	Area 4	561
Stream 35a	38.185921	-82.645834	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	211
Stream 35b	38.185204	-82.6465	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 4	78
Stream 36	38.177545	-82.638531	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	280
Stream 37	38.176969	-82.642526	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	171
Stream 38	38.17922	-82.644498	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	279
Stream 39	38.181365	-82.645372	Tributary to fly ash pond	Intermittent	HGS	NA	Area 6	169
Stream 40	38.1813	-82.645778	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	157
Stream 41	38.181378	-82.645992	Tributary to fly ash pond	Intermittent	HGS	NA	Area 6	652
Stream 41a	38.18117	-82.646067	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	56
Stream 42	38.182146	-82.648394	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	114
Stream 43	38.184011	-82.647594	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	368
Stream 44	38.1842	-82.649991	Tributary to fly ash pond	Perennial	RBA	142	Sub-Optimal	2,379
Stream 44a	38.18488	-82.650217	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	554
Stream 44b	38.182484	-82.653843	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	633
Stream 44c	38.181227	-82.653997	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	232
Stream 45	38.183078	-82.637348	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	93
Stream 46	38.18363	-82.638883	Tributary to fly ash pond	Intermittent	HGS	NA	Area 3	432
Stream 47	38.182258	-82.635048	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	48

TABLE 5
DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Waterbody	Flow Regime	Form Used[a]	Score[b]	Stream Quality or Habitat Area	Linear Feet within Survey Area
Stream 48	38.183095	-82.638419	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	73
Stream 49	38.181963	-82.637701	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	109
Stream 50	38.185788	-82.635826	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	116
Stream 51	38.185756	-82.635877	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	75
Stream 52	38.181211	-82.628042	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	47
Stream 53	38.182467	-82.627866	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	64
Stream 54	38.182315	-82.627723	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	39
Stream 55	38.184567	-82.629622	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	88
Stream 56	38.178126	-82.633154	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	36
Stream 57	38.178022	-82.630229	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	43
Stream 58	38.174032	-82.647949	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	604
Stream 59	38.174786	-82.646863	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	881
Stream 59a	38.174412	-82.646894	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	304
Stream 60	38.176137	-82.646625	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	692
Stream 60a	38.175762	-82.647063	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	149
Stream 61	38.180213	-82.627552	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	31
Stream 62	38.182122	-82.627641	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	70
Stream 63	38.182254	-82.627658	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	77
Stream 64	38.184825	-82.629898	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	77
Stream 65	38.185999	-82.630599	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	19
Stream 66	38.186103	-82.630655	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	30
Stream 67	38.178037	-82.63036	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	51
Stream 68	38.175615	-82.647681	Tributary to Fuller's Branch	Perennial	RBA	167	Optimal	1,381
Stream 68a	38.174678	-82.648721	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	92
Stream 68b	38.17473	-82.648255	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	62
Stream 68c	38.17447	-82.648223	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	224
Stream 68d	38.175023	-82.647836	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	158
Stream 68e	38.174797	-82.648466	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	69
Stream 68f	38.175329	-82.647784	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	68

TABLE 5
DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Waterbody	Flow Regime	Form Used[a]	Score[b]	Stream Quality or Habitat Area	Linear Feet within Survey Area
Stream 68g	38.174959	-82.648427	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	130
Stream 68h	38.17541	-82.647479	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	200
Stream 68i	38.17517	-82.648242	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	104
Stream 68j	38.175685	-82.647456	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	102
Stream 68k	38.175554	-82.647476	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	139
Stream 68l	38.177244	-82.647641	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	65
Stream 68m	38.177145	-82.647626	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	85
Stream 68n	38.177322	-82.647374	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	204
Stream 68o	38.176957	-82.647088	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	256
Stream 68p	38.1764	-82.647351	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	58
Stream 68q	38.176428	-82.646887	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	251
Stream 68r	38.176653	-82.647099	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	266
Stream 69	38.176948	-82.648002	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	412
Stream 70	38.183888	-82.650984	Tributary to fly ash pond	Intermittent	HGS	NA	Area 5	442
Stream 70a	38.183487	-82.651216	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	75
Stream 70b	38.183499	-82.650664	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	310
Stream 71	38.185572	-82.653279	Tributary to fly ash pond	Intermittent	RBA	118	Sub-Optimal	1,816
Stream 71a	38.185856	-82.652998	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	262
Stream 71b	38.18583	-82.653492	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	131
Stream 71c	38.186375	-82.654015	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	548
Stream 71d	38.1858	-82.654716	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	440
Stream 71e	38.185899	-82.655866	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	81
Stream 71f	38.185596	-82.655933	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 5	222
Stream 72	38.181433	-82.624959	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	175
Stream 73	38.182305	-82.625104	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	210
Stream 74	38.184755	-82.626268	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	336
Stream 75	38.185768	-82.626399	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	108
Stream 76	38.186226	-82.626544	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	385
Stream 77	38.185364	-82.625733	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	36

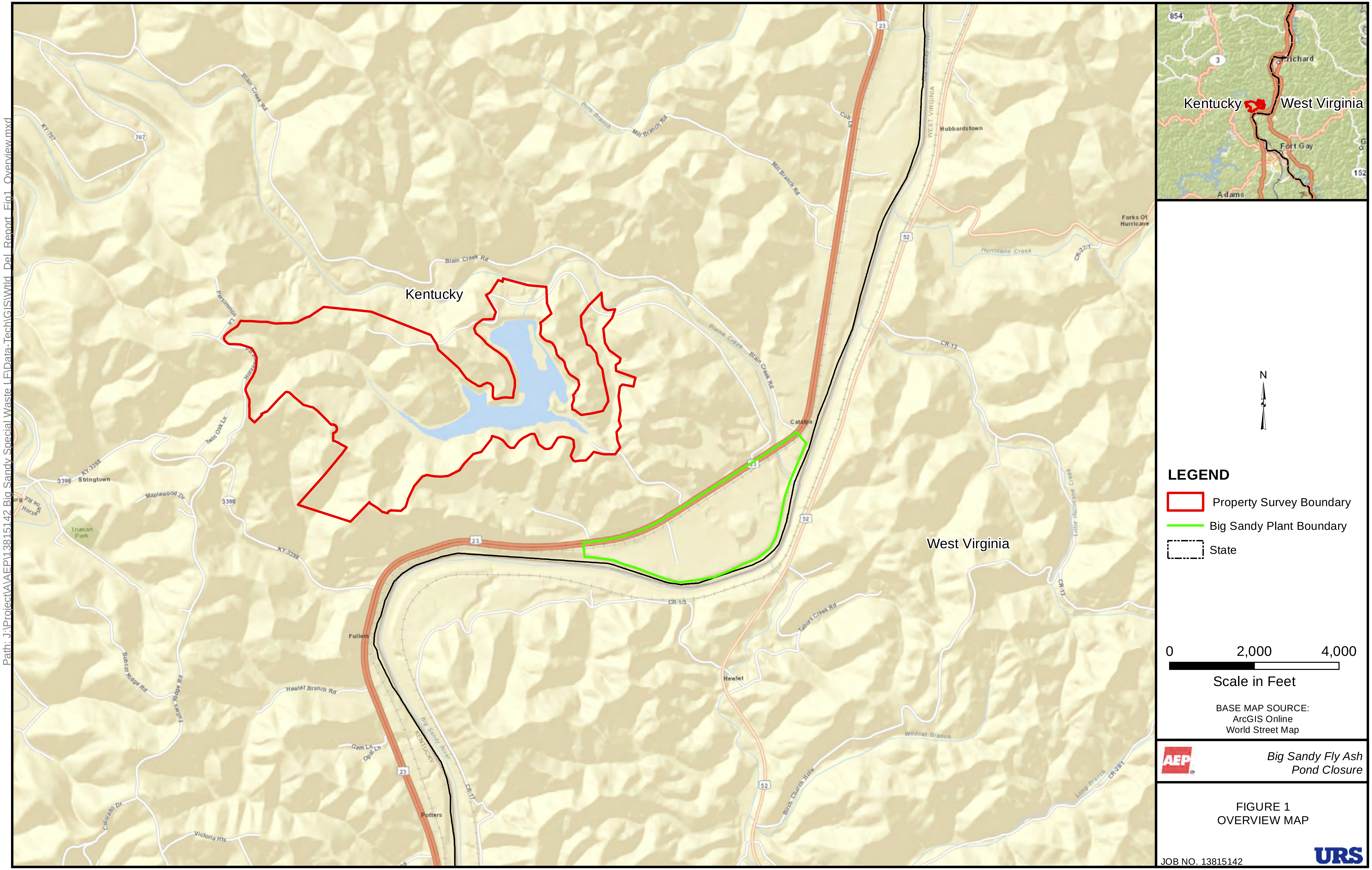
TABLE 5
DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Waterbody	Flow Regime	Form Used[a]	Score[b]	Stream Quality or Habitat Area	Linear Feet within Survey Area
Stream 78	38.183861	-82.624616	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	354
Stream 78a	38.183771	-82.624265	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	120
Stream 78b	38.183921	-82.62445	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	61
Stream 78c	38.184067	-82.624865	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	96
Stream 79	38.182304	-82.623863	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	542
Stream 79a	38.182473	-82.623487	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	391
Stream 79aa	38.182373	-82.622941	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	53
Stream 80	38.186308	-82.626727	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	132
Stream 80a	38.18624	-82.62678	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	80
Total: 154								**42,420**

Form Used[a] : RBA = Rapid Bioassessment Protocol, HGS = High Gradient Stream
Score[b] : NA = Not Applicable

TABLE 6
DELINEATED PONDS WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Acreage within Survey Corridor
Pond 1	38.177116	-82.641885	0.24
Total: 1			**0.24**



BASE MAP SOURCE:
ArcGIS Online
World Street Map

AEP

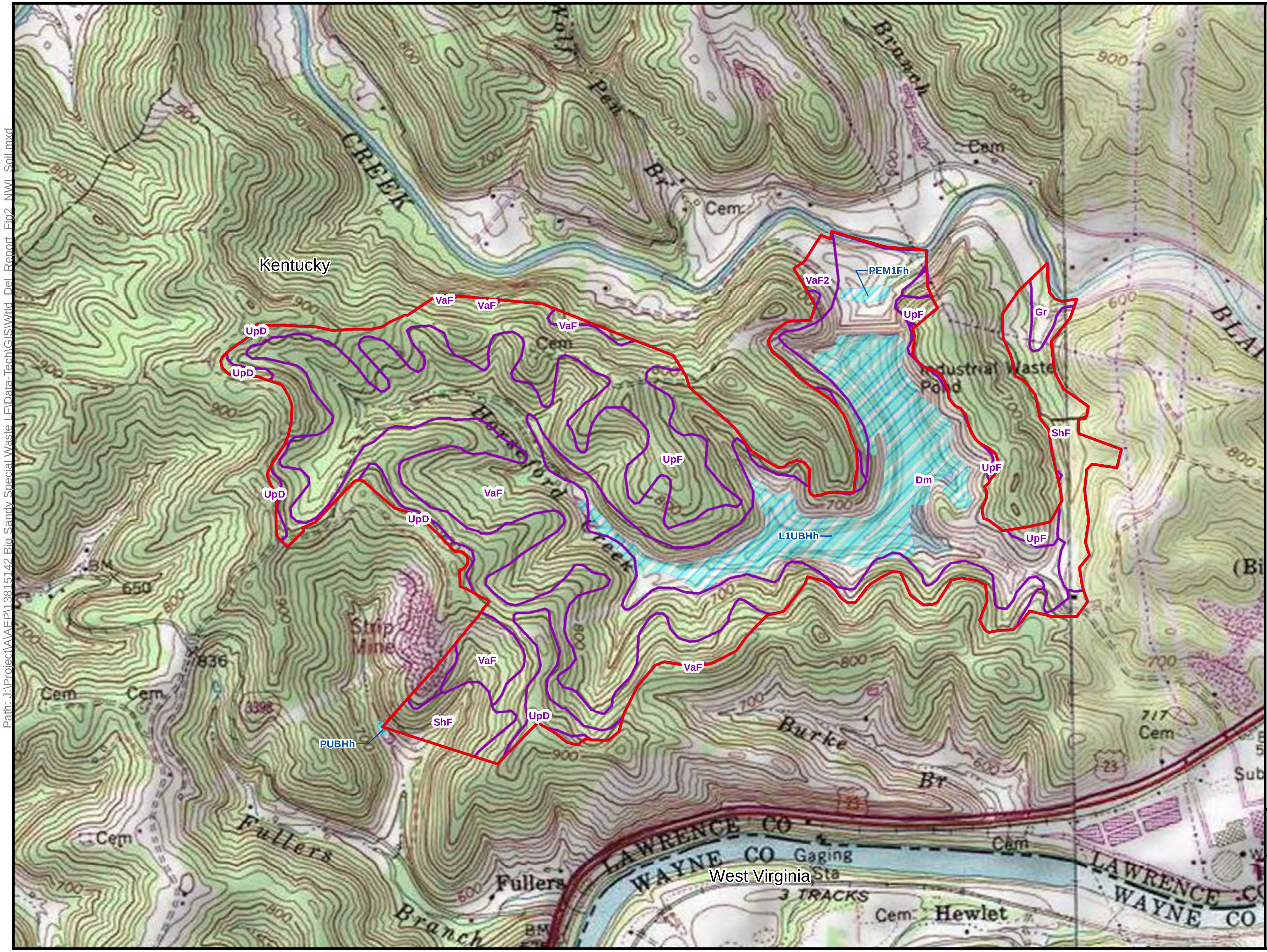
Big Sandy Fly Ash
Pond Closure

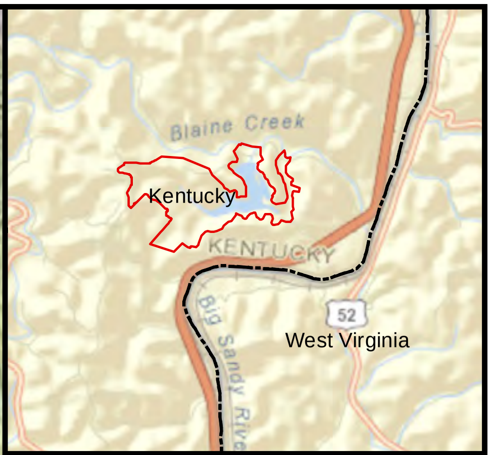
FIGURE 1
OVERVIEW MAP

JOB NO. 13815142

URS

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\Wtld Del Report Fig1 Overview.mxd





N

LEGEND

- 🟥 Property Survey Boundary
- 🟪 Soil Map Unit
- ▨ NWI Wetland

0 1,000 2,000

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online
USA Topo Maps
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash
Pond Closure

FIGURE 2
NATIONAL WETLAND INVENTORY
AND SOIL MAP UNITS MAP

JOB NO. 13815142

URS

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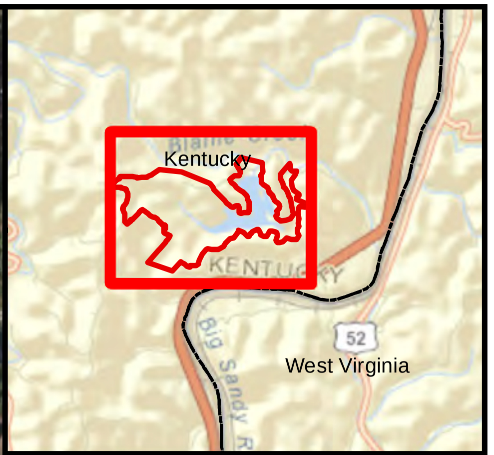

N

LEGEND

🟥 Project Survey Boundary

▨ Delineated Wetland

🟦 Delineated Pond

— RBA Delineated Stream

▶ Stream Flow Direction

High Gradient Stream Habitat Areas

— Area 1 Delineated Stream

— Area 2 Delineated Stream

— Area 3 Delineated Stream

— Area 4 Delineated Stream

— Area 5 Delineated Stream

— Area 6 Delineated Stream

— Area 7 Delineated Stream

0 750 1,500

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash
Pond Closure

FIGURE 3
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

URS

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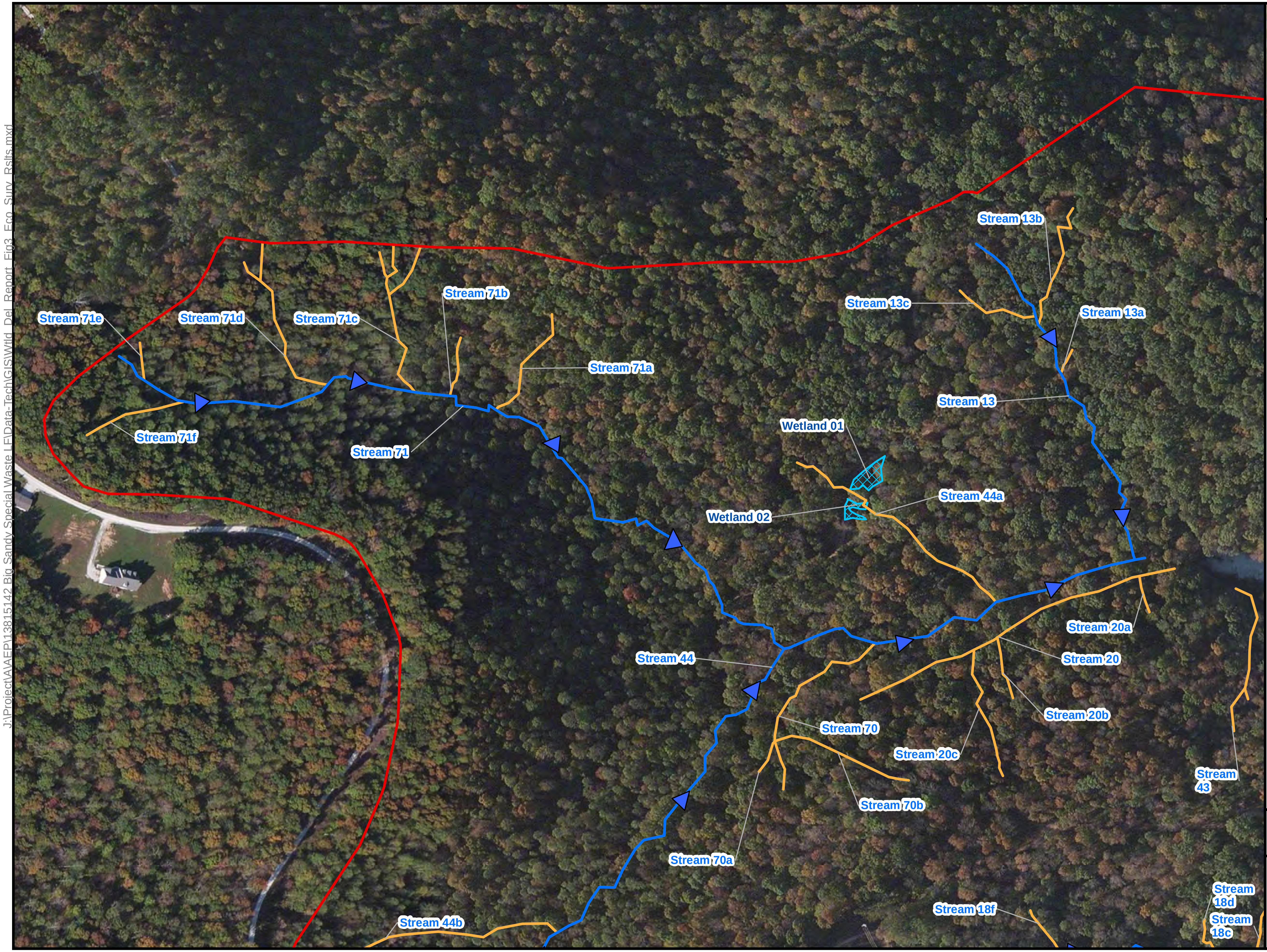

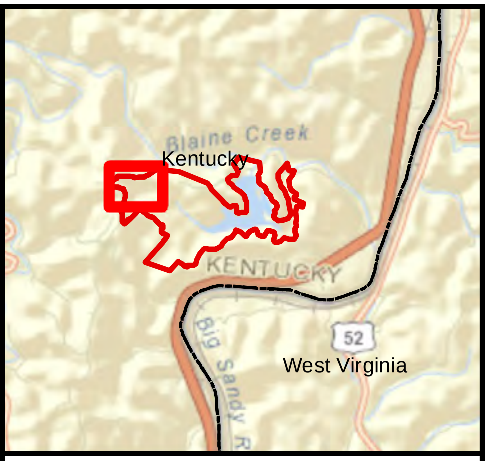

N

LEGEND

- ▭ Project Survey Boundary
- ▨ Delineated Wetland
- ▭ Delineated Pond
- — RBA Delineated Stream
- ▶ Stream Flow Direction

High Gradient Stream Habitat Areas

- — Area 1 Delineated Stream
- — Area 2 Delineated Stream
- — Area 3 Delineated Stream
- — Area 4 Delineated Stream
- — Area 5 Delineated Stream
- — Area 6 Delineated Stream
- — Area 7 Delineated Stream

0 200 400

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash
Pond Closure

FIGURE 3A
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

URS

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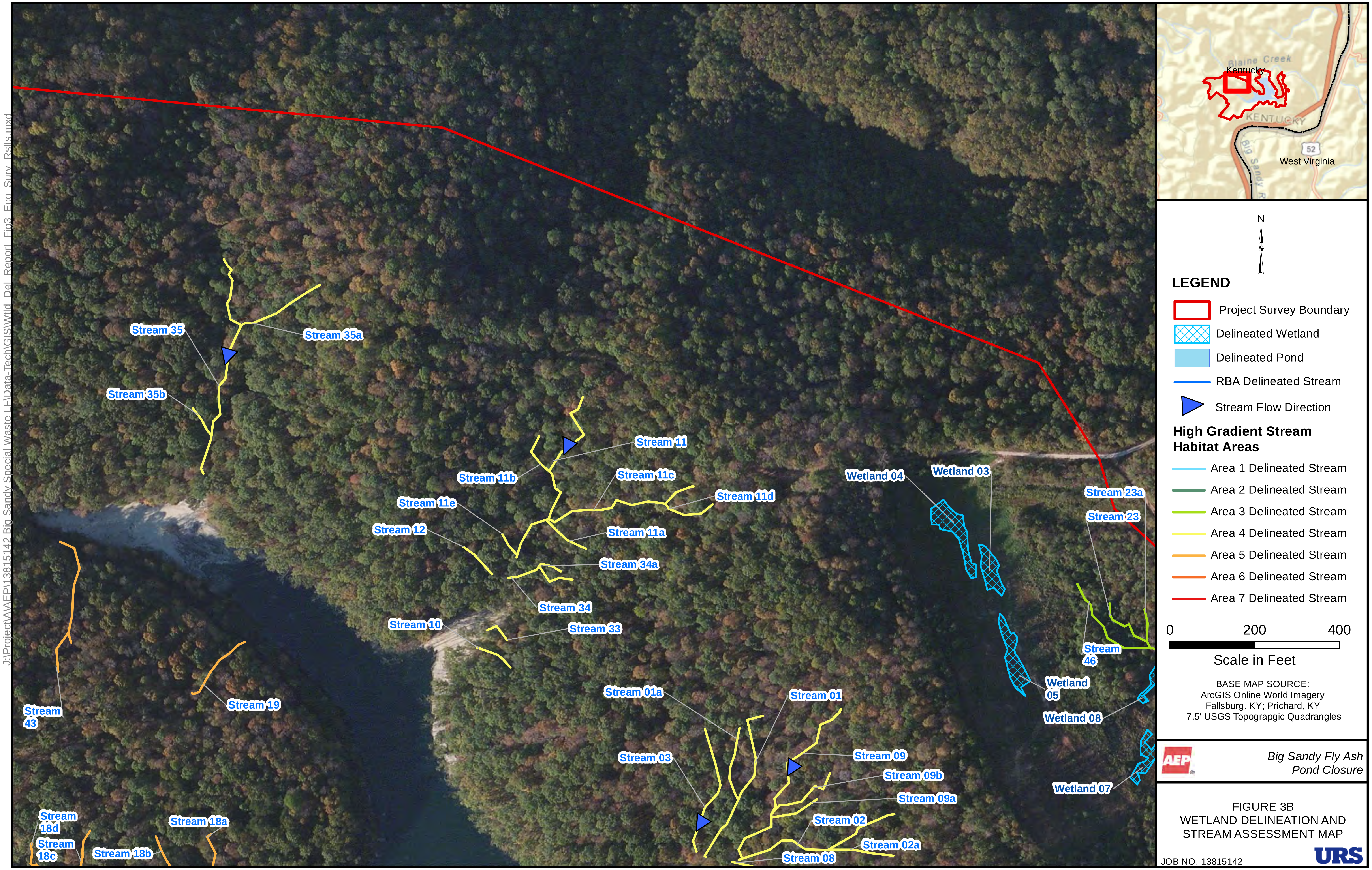

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash Pond Closure

FIGURE 3B
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

URS

J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\Wtld_Del_Report_Fig3_Eco_Surv_Rslts.mxd

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash
Pond Closure

FIGURE 3C
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

URS

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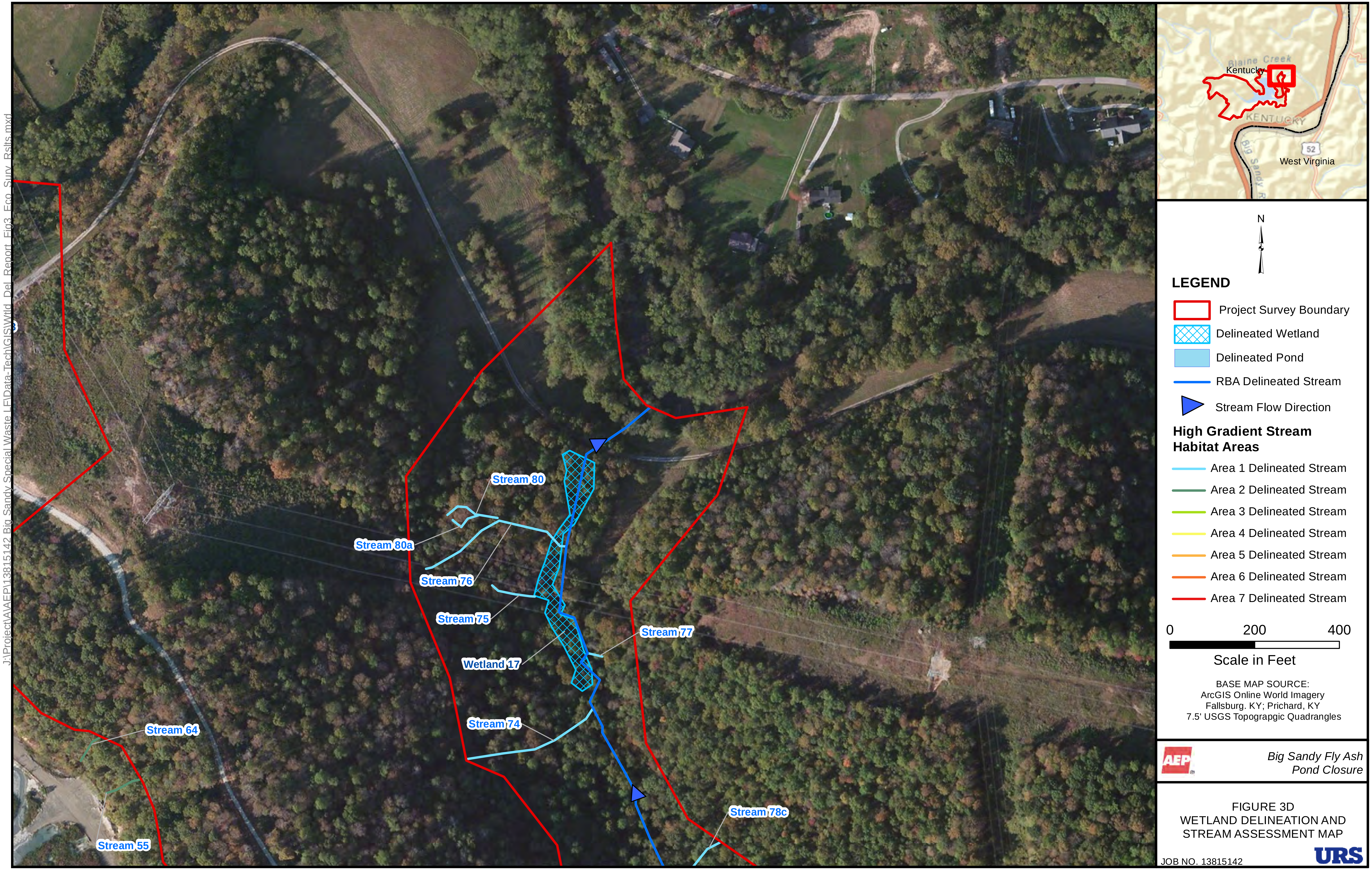

LEGEND

🟥	Project Survey Boundary
▨	Delineated Wetland
🟦	Delineated Pond
—	RBA Delineated Stream
▶	Stream Flow Direction

High Gradient Stream Habitat Areas

—	Area 1 Delineated Stream
—	Area 2 Delineated Stream
—	Area 3 Delineated Stream
—	Area 4 Delineated Stream
—	Area 5 Delineated Stream
—	Area 6 Delineated Stream
—	Area 7 Delineated Stream

0 200 400
Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash
Pond Closure

FIGURE 3D
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

URS

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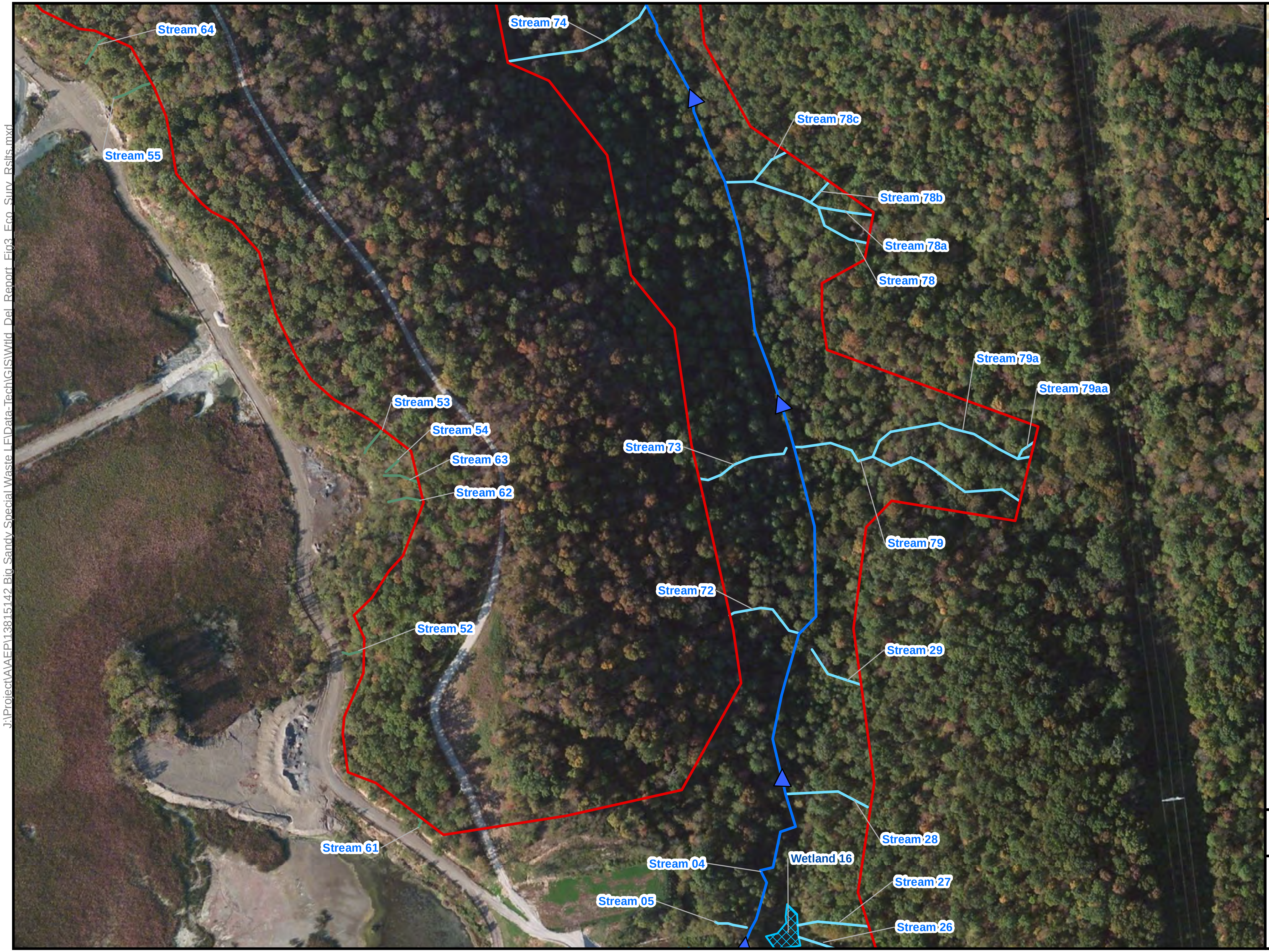

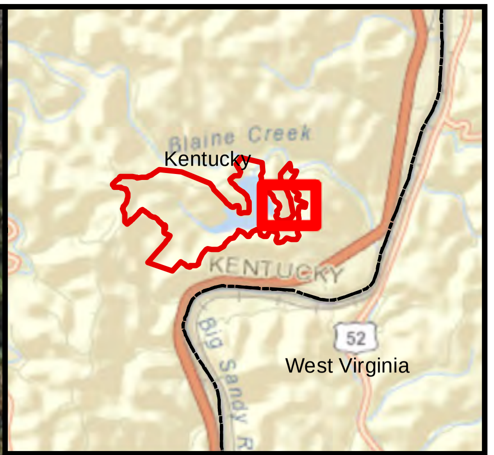

N

LEGEND

- 🟥 Project Survey Boundary
- ▨ Delineated Wetland
- 🟦 Delineated Pond
- — RBA Delineated Stream
- ▶ Stream Flow Direction

High Gradient Stream Habitat Areas

- — Area 1 Delineated Stream
- — Area 2 Delineated Stream
- — Area 3 Delineated Stream
- — Area 4 Delineated Stream
- — Area 5 Delineated Stream
- — Area 6 Delineated Stream
- — Area 7 Delineated Stream

0 200 400

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash Pond Closure

FIGURE 3E
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

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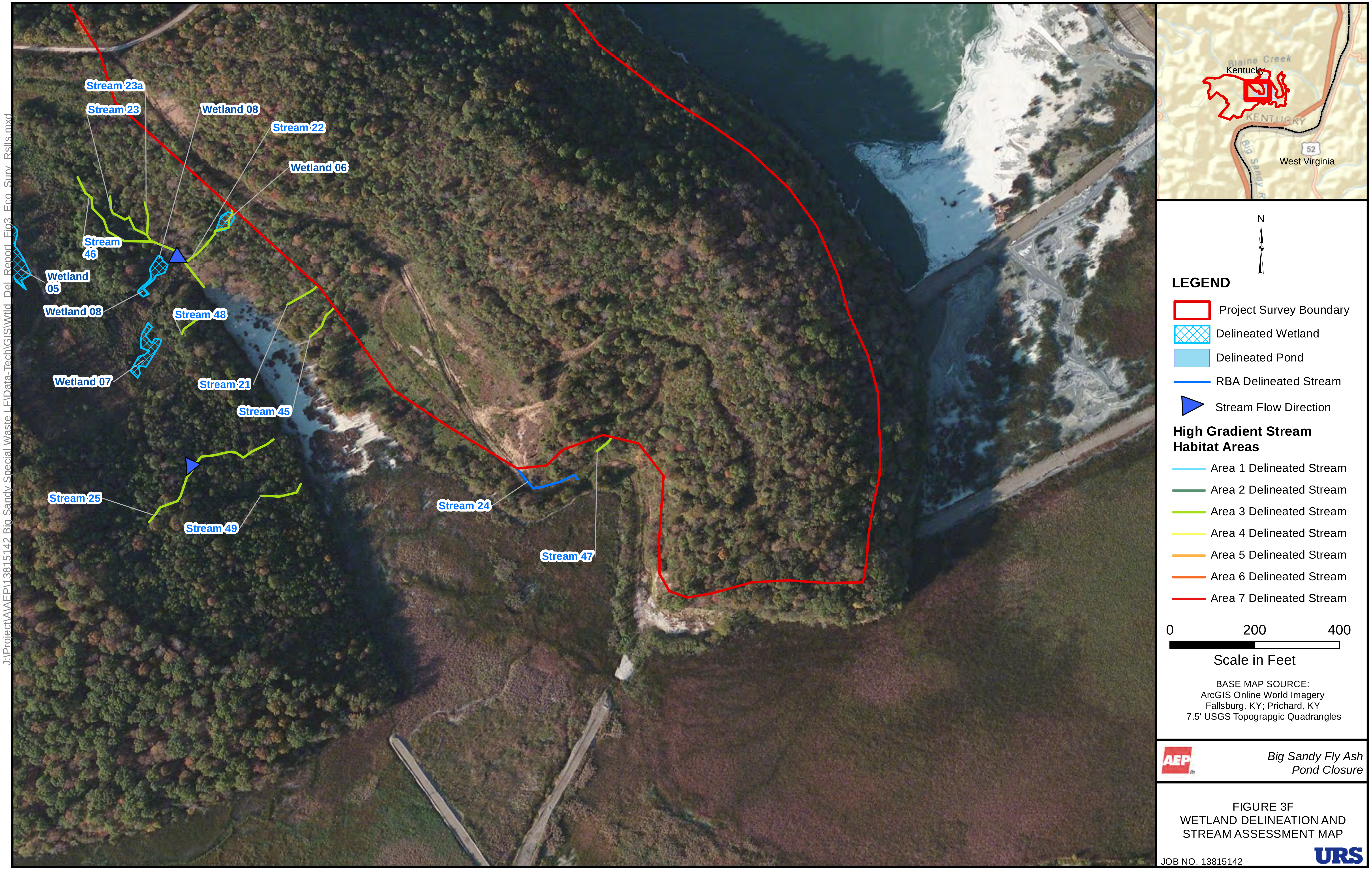

LEGEND

🟥	Project Survey Boundary
▨	Delineated Wetland
🟦	Delineated Pond
—	RBA Delineated Stream
▶	Stream Flow Direction

High Gradient Stream Habitat Areas

—	Area 1 Delineated Stream
—	Area 2 Delineated Stream
—	Area 3 Delineated Stream
—	Area 4 Delineated Stream
—	Area 5 Delineated Stream
—	Area 6 Delineated Stream
—	Area 7 Delineated Stream

0 200 400

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

Big Sandy Fly Ash
Pond Closure

FIGURE 3F
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

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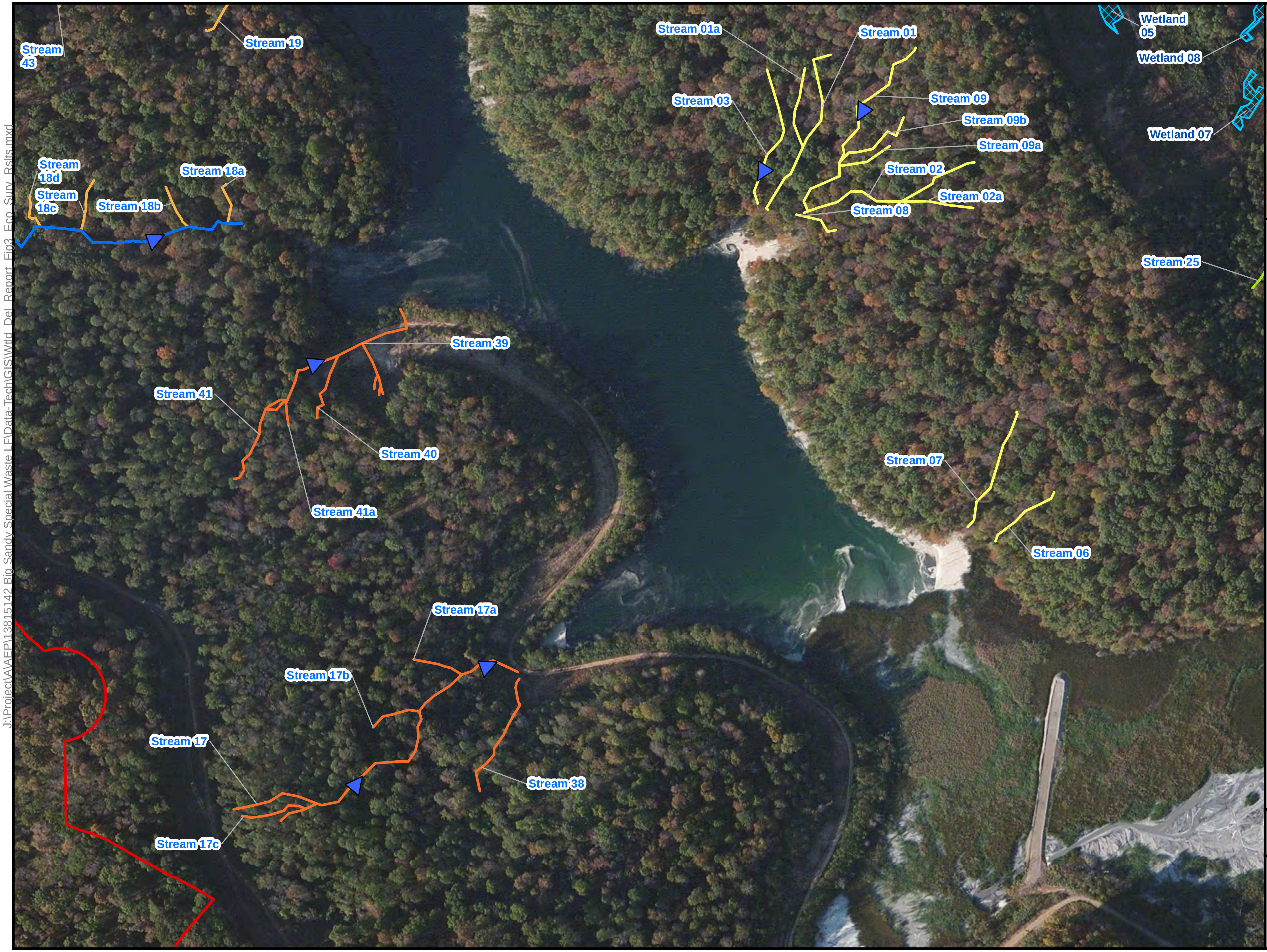

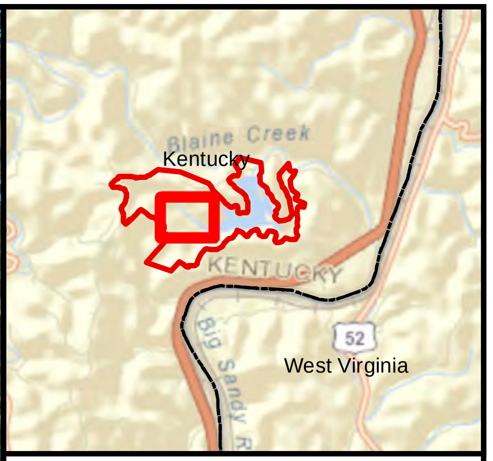

N

LEGEND

- 🟥 Project Survey Boundary
- ▨ Delineated Wetland
- 🟦 Delineated Pond
- — RBA Delineated Stream
- ▶ Stream Flow Direction

High Gradient Stream Habitat Areas

- — Area 1 Delineated Stream
- — Area 2 Delineated Stream
- — Area 3 Delineated Stream
- — Area 4 Delineated Stream
- — Area 5 Delineated Stream
- — Area 6 Delineated Stream
- — Area 7 Delineated Stream

0 200 400

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

Big Sandy Fly Ash
Pond Closure

FIGURE 3G
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

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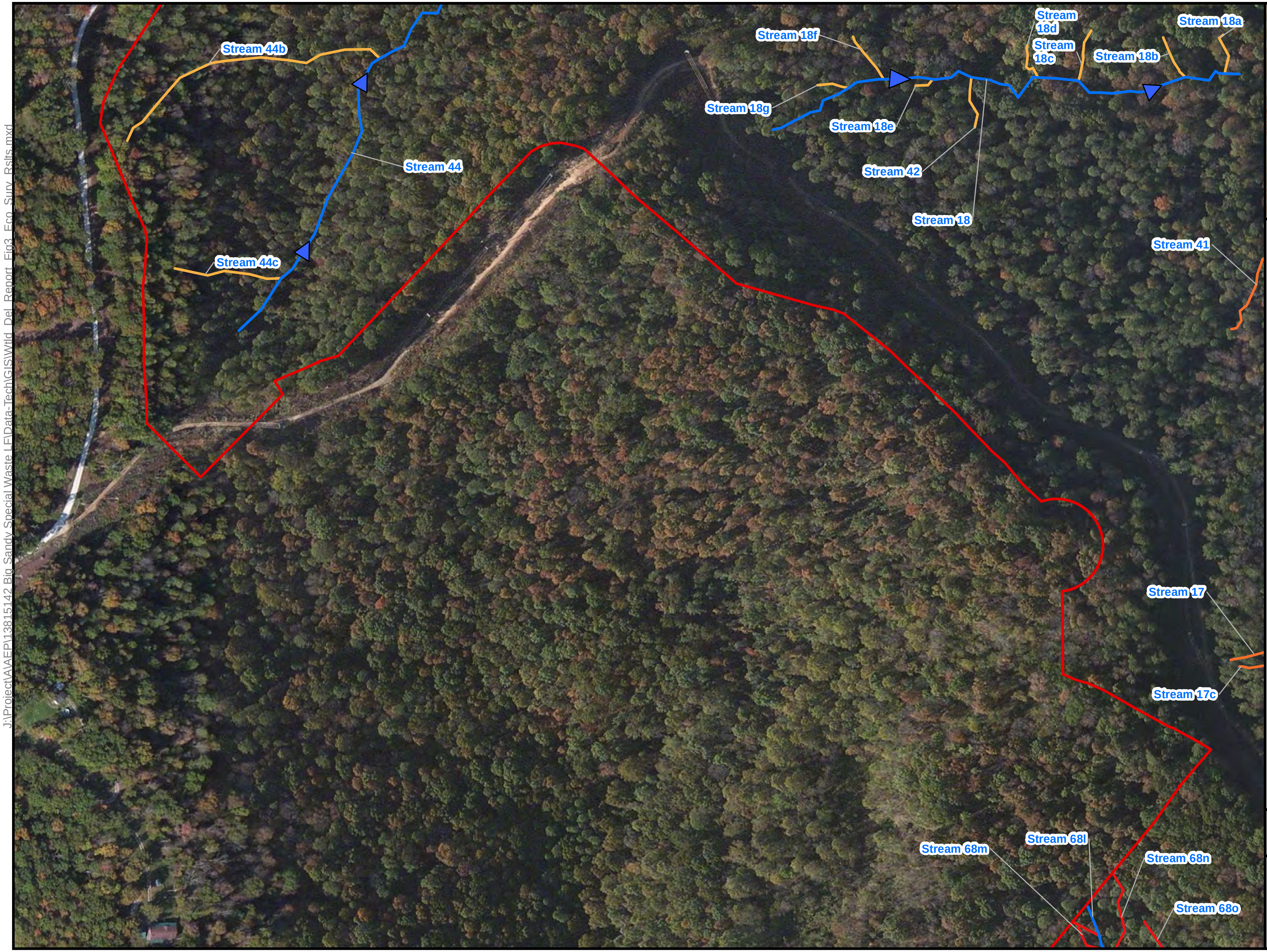

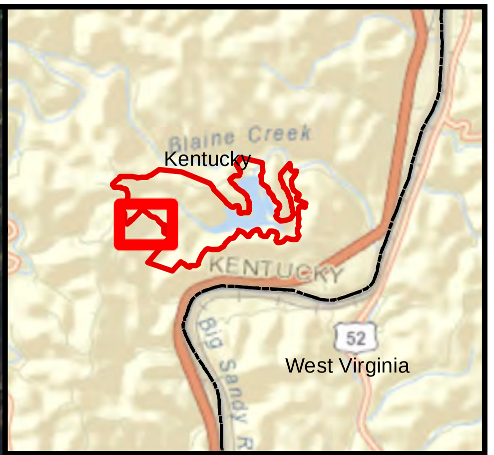

N

LEGEND

- ▭ Project Survey Boundary
- ▨ Delineated Wetland
- ■ Delineated Pond
- — RBA Delineated Stream
- ▶ Stream Flow Direction

High Gradient Stream Habitat Areas

- — Area 1 Delineated Stream
- — Area 2 Delineated Stream
- — Area 3 Delineated Stream
- — Area 4 Delineated Stream
- — Area 5 Delineated Stream
- — Area 6 Delineated Stream
- — Area 7 Delineated Stream

0 200 400
Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

Big Sandy Fly Ash Pond Closure

FIGURE 3H
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

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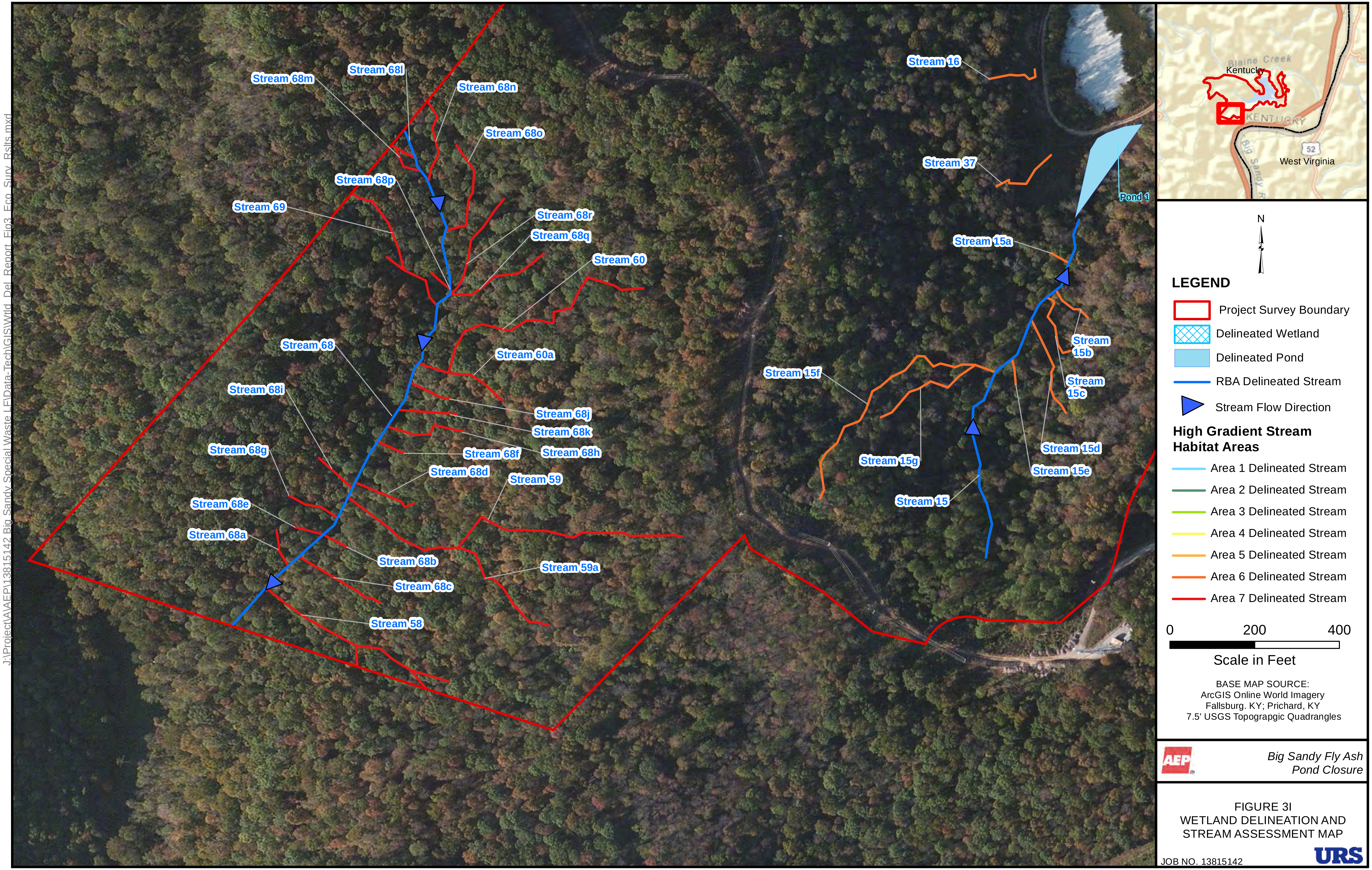


LEGEND

- 🟥 Project Survey Boundary
- ▨ Delineated Wetland
- 🟦 Delineated Pond
- — RBA Delineated Stream
- ▶ Stream Flow Direction

High Gradient Stream Habitat Areas

- — Area 1 Delineated Stream
- — Area 2 Delineated Stream
- — Area 3 Delineated Stream
- — Area 4 Delineated Stream
- — Area 5 Delineated Stream
- — Area 6 Delineated Stream
- — Area 7 Delineated Stream

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

Big Sandy Fly Ash
Pond Closure

FIGURE 3I
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\Wtld_Del_Report_Fig3_Eco_Surv_Rslts.mxd

LEGEND

- 🟥 Project Survey Boundary
- ▨ Delineated Wetland
- 🟦 Delineated Pond
- RBA Delineated Stream
- ▶ Stream Flow Direction

High Gradient Stream Habitat Areas

- Area 1 Delineated Stream
- Area 2 Delineated Stream
- Area 3 Delineated Stream
- Area 4 Delineated Stream
- Area 5 Delineated Stream
- Area 6 Delineated Stream
- Area 7 Delineated Stream

0 200 400
Scale in Feet

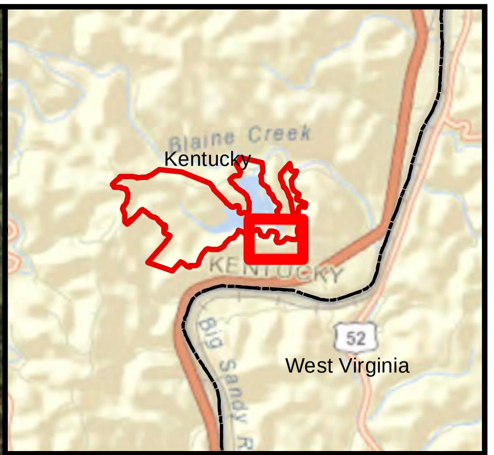
BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

Big Sandy Fly Ash Pond Closure

FIGURE 3J
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\Wtld_Del_Report_Fig3_Eco_Surv_Rslts.mxd



N

LEGEND

🟥	Project Survey Boundary
▨	Delineated Wetland
■	Delineated Pond
—	RBA Delineated Stream
▶	Stream Flow Direction

High Gradient Stream Habitat Areas

—	Area 1 Delineated Stream
—	Area 2 Delineated Stream
—	Area 3 Delineated Stream
—	Area 4 Delineated Stream
—	Area 5 Delineated Stream
—	Area 6 Delineated Stream
—	Area 7 Delineated Stream

0 200 400

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash Pond Closure

FIGURE 3K
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

URS

APPENDIX A

U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION DATA FORMS

WETLAND 1

— W-BAO-052312-01

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY POND CLOSURE City/County: LOUISA, LAWRENCE Sampling Date: 05/23/12
Applicant/Owner: AEP State: KY Sampling Point: 01
Investigator(s): BAO, MDT Section, Township, Range: ____
Landform (hillslope, terrace, etc.): DEPRESSIONAL Local relief (concave, convex, none): CONCAVE Slope (%): ____
Subregion (LRR or MLRA): ____ Lat: 38.185144 Long: -82.65642 Datum: ____
Soil Map Unit Name: VaF NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:

PEM/PSS WETLAND LOCATED ON SIDE OF ACCESS ROAD, THAT APPEARS TO HAVE BEEN A HISTORICALLY EXCAVATED AREA

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)
- ☐ 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)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes X **No** ____

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

Remarks:

WETLAND IS ABUTTING EPH. STREAM S-MDT052312-02-SIDE #1

WETLAND 1

W-BA0052310-01

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ____________

Tree Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1. NONE			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	30	X	FACW
2. Fraxinus pennsylvanica	10		FACW
3.			
4.			
5.			
6.			
7.			
	40 = Total Cover		

Shrub Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus allegheniensis	10	X	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		

Herb Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Dichanthelium clandestinum	50	X	FAC
2. Impatiens capensis	15		FACW
3. Scirpus atrovirens	40	X	OBL
4. Carex vulpinoidea	20		OBL
5. Onoclea sensibilis	5		FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	130 = Total Cover		

Woody Vine Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
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% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	60	x 1 = 60
FACW species	60	x 2 = 120
FAC species	50	x 3 = 150
FACU species	10	x 4 = 40
UPL species		x 5 =
Column Totals:	180 (A)	370 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ____

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

WETLAND 1

W-BAO-052312-01

SOIL

Sampling Point: ______

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	10YR 6/1	70	10YR 5/8	30	C	M	Silty Clay	
6-12	10YR 6/1	100	—				Clay	

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) (**LRR N**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
___ Thin Dark Surface (S9) (**MLRA 147, 148**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
___ Umbric Surface (F13) (**MLRA 136, 122**)
___ Piedmont Floodplain Soils (F19) (**MLRA 148**)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) (**MLRA 147**)
___ Coast Prairie Redox (A16) (**MLRA 147, 148**)
___ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ______

Remarks:

WETLAND 2

W-BAO-052312-02

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIGSANDY POND CLOSURE City/County: LOUISA, LAWRENCE Sampling Date: 05/23/12
Applicant/Owner: AEP State: KY Sampling Point: 02
Investigator(s): BAO, MDT Section, Township, Range: ____
Landform (hillslope, terrace, etc.): DEPRESSIONAL Local relief (concave, convex, none): CONCAVE Slope (%): ____
Subregion (LRR or MLRA): ____ Lat: 38.18494 Long: -82.650542 Datum: ____
Soil Map Unit Name: UpF 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 N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:

PEM WETLAND LOCATED ON SIDE OF ACCESS ROAD THAT APPEARS TO HAVE BEEN A HISTORICALLY EXCAVATED AREA

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

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

Remarks:

WETLAND IS ABUTTING EPHEMERAL STREAM S-MDT-052312-07 SIDE #1

WETLAND 2

W-BRD-052312-02

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. NONE			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ______)			
1. NONE			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ______)			
1. NONE			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ______)			
1. Scirpus cyperinus	15		FACW
2. Scirpus atrovirens	20		OBL
3. Juncus effusus	10		FACW
4. Carex vulpinoidea	30	X	OBL
5. Dichanthelium clandestinum	30	X	FAC
6. Impatiens capensis	10		FACW
7. Juncus tenuis	10		FAC
8.			
9.			
10.			
11.			
12.			
	125 = Total Cover		

Woody Vine Stratum (Plot size: ______)			
1. NONE			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	50	x 1 = 50
FACW species	35	x 2 = 70
FAC species	40	x 3 = 120
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	125 (A)	240 (B)

Prevalence Index = B/A = 1.92

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

WETLAND 2

W-BAO-050312-02

SOIL

Sampling Point: ____________

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	10YR 6/1	70	10YR 5/8	30	C	M	SILTY CLAY	
6-12	10YR6/1	100	—				CLAY	

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 136, 122)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ____________________

Depth (inches): ____________________

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND 3

W-MDT-052412-01

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY City/County: LAWRENCE Sampling Date: 052412
Applicant/Owner: AEP State: KY Sampling Point: 01
Investigator(s): BAO, MDT Section, Township, Range: ______
Landform (hillslope, terrace, etc.): HILLSLOPE, SEEP Local relief (concave, convex, none): SLOPE Slope (%): ______
Subregion (LRR or MLRA): ______ Lat: 38.184148 Long: -82.64005 Datum: ______
Soil Map Unit Name: UpF NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)
Are Vegetation N, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes ______ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
PEM WETLAND SEEP LOCATED ON HILLSLOPE. WETLAND IS DOMINATED BY JUNCUS effuses. FORMERLY EXCAVATED AREA (BORROW AREA)

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): 1"
Water Table Present? Yes ______ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): SURFACE

Wetland Hydrology Present? Yes ______ No ______

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

Remarks:

HILLSIDE SEEP w/ SATURATION & INUNDATION PRESENT. SEEPAGE THROUGH BEDROCK LAYERS

WETLAND 3

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: W-Wd4 52412-

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ____)			
1. Juncus effuses	50	X	FACW
2. Juncus tenuis	20	X	FAC
3. WOOLGRASS - Scirpus Cyperinus	10		FACW
4. SEEDBOX - Ludwigia alternifolia	5		FACU
5. GOLDEN ROD Spp. - SOLIDAGO Spp.	5		FAC
6. FOXTAIL SEDGE Spp.	5		FAC
7. JOE PYE WEED - EUTROCHIUM purpureum	10		FAC
8. Schizachyrium Scoparium	10		FACU
9. NARROWLEAF CATTAIL - TYPHA ANGUSTIFOLIA	2		OBL
10. DARK GREEN BULRUSH - SCIRPUS ATROVIRENS	2		OBL
11.			
12.			
	119 = Total Cover		

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	4	x 1 =	4
FACW species	65	x 2 =	130
FAC species	40	x 3 =	120
FACU species	10	x 4 =	40
UPL species		x 5 =	
Column Totals:	119 (A)		294 (B)

Prevalence Index = B/A = 2.4

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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ____

WETLAND 3

SOIL

Sampling Point: W7Wd TS24/12-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	*SEE BELOW*							
8-	REFUSAL	BEDROCK						

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

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ 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:

* DISTURBED SOILS, GRAVELY, SANDY CLAY WITH VARIOUS MOTTLING. *
AT 8" REFUSAL AT BEDROCK

MOTTLES - ORANGE, WHITISH GREY, BLACK.

THE VARIOUS MOTTLING & UNSORTED GRAVEL ALLUVIUM APPEARS TO BE CAUSED BY HISTORIC DISTURBANCE

WETLAND 4

W-MDT-052412-02

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY City/County: LOUISA, LAWRENCE Sampling Date: 2012, MAY 24

Applicant/Owner: AEP State: OH Sampling Point: 02

Investigator(s): BAO, MDT Section, Township, Range: ___

Landform (hillslope, terrace, etc.): SEEP Local relief (concave, convex, none): CONVEX Slope (%): ___

Subregion (LRR or MLRA): ___ Lat: 38.184414 Long: -82.640347 Datum: ___

Soil Map Unit Name: UpF NWI classification: NA

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

Are Vegetation N, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X *

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

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

Hydrophytic Vegetation Present? Yes X No ___

Hydric Soil Present? Yes X No ___

Wetland Hydrology Present? Yes X No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks:

PEM WETLAND SEEP LOCATED ON HILLSLOPE. * PREVIOUSLY EXCAVATED AREA WITH DISTURBED SOILS. (FORMER BORROW AREA) *

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

HILLSIDE SEEP W/ SATURATION PRESENT

WETLAND 4

W-MDT-052410-02

SOIL

Sampling Point: ___________

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	* SEE BELOW *							
4-	REFUSAL							

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

Hydric Soil Indicators:

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10) **(LRR N)**
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
☐ Umbric Surface (F13) **(MLRA 136, 122)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

☐ 2 cm Muck (A10) **(MLRA 147)**
☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
☐ Red Parent Material (TF2)
☐ 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:

* DISTURBED SOILS & SANDY CLAY WITH SOME GRAVEL

4" REFUSAL at BEDROCK

VARIOUS MOTTLING WAS OBSERVED ALONG W/ UNSORTED GRAVEL ALLUVIUM & FRACTURED BEDROCK THAT APPEAR DUE TO HISTORIC DISTURBANCE

WETLAND 4

W-MOT-058412-02

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. JUNCUS effuses	45	X	FACW
2. Juncus tenuis	20	X	FAC
3. WOOLGRASS - SCIRPUS CYPERNUS	10		FACW
4. SEEDBOX - LUDWIGIA alternifolia	5		FACW
5. GOLDENROD - SOLIDAGO SPP.	15		FAC
6. FOXTAIL SEDGE - Setaria spp.	5		FAC
7. JOE PYE WEED - EUTROCHIUM purpureum	10		FAC
8. Schizachyrium scoparium	5		FACU
9. NARROWLEAF CATTAIL - Typha angustifolia	2		OBL
10. DARKGREEN BULRUSH - SCIRPUS atrovirens	2		OBL
11. SPHAGNUM MOSS SPP.	2		OBL
12.			
	121 = Total Cover		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	6	x 1 =	6
FACW species	60	x 2 =	120
FAC species	50	x 3 =	150
FACU species	5	x 4 =	20
UPL species		x 5 =	
Column Totals:	121 (A)		296 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

WETLAND 5

W-MDT-052412-03

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY City/County: LAWRENCE Sampling Date: 2012, MAY 24

Applicant/Owner: AEP State: KY Sampling Point: 03

Investigator(s): BAO, MDT Section, Township, Range: ______

Landform (hillslope, terrace, etc.): HILLSIDE SEEP, TOE-OF-SLOPE Local relief (concave, convex, none): SLOPE Slope (%): ______

Subregion (LRR or MLRA): ______ Lat: 38.18358 Long: -82.639677 Datum: ______

Soil Map Unit Name: UpF NWI classification: ______

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

Are Vegetation N, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes ______ No X *

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

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

Hydrophytic Vegetation Present? Yes X No ______

Hydric Soil Present? Yes X No ______

Wetland Hydrology Present? Yes X No ______

Is the Sampled Area within a Wetland? Yes X No ______

Remarks:

PEM WETLAND LOCATED AT TOE-OF-SLOPE. *PREVIOUSLY EXCAVATED AREA WITH DISTURBED SOILS. (FORMER BORROW AREA)*

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): 1.5"

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

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

Wetland Hydrology Present? Yes X No ______

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

Remarks:

TOE-OF-SLOPE WITH INUNDATION & SATURATION PRESENT

WETLAND 5

W-MDT-050410-03

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ______)			
1. BLUESTEM - Schizochyrium Scoparium	25		FACU
2. JUNCUS Tenuis	70	X	FAC
3. NARROWLEAF CATTAIL - Typha Angustifolia	2		OBL
4. BROADLEAF CATTAIL - Typha latifolia	5		OBL
5. WOOLGRASS - SCIRPUS CYPERNUS	10		FACW
6. DARK GREEN BULRUSH - SCIRPUS atrovirens	2		OBL
7. JUNCUS EFFUSUS	10		FACW
8. SPHAGNUM MOSS SP.	15		OBL
9.			
10.			
11.			
12.			
	139 = Total Cover		

Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	24	x 1 =	24
FACW species	20	x 2 =	40
FAC species	70	x 3 =	210
FACU species	25	x 4 =	100
UPL species		x 5 =	
Column Totals:	139 (A)		374 (B)

Prevalence Index = B/A = 2.69

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ______

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

WETLAND 5

W-MDT-050412-03

SOIL

Sampling Point: ____________

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	*SEE BELOW*							
4	REFUSAL							

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 136, 122)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
_X_ 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): 4"

Hydric Soil Present? Yes _X_ No ____

Remarks:

* DISTURBED SOILS, SANDY CLAY WITH SOME GRAVEL
REFUSAL WAS AT 4" AT BEDROCK.
SOILS NOTED w/ VARIOUS MOTTLING & UNSORTED GRAVEL
ALLUVIUM & FRACTURED BEDROCK THAT APPEARS DUE
TO HISTORIC DISTURBANCE

WETLAND 6 W-BAO-052412-05

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY City/County: LOUISA, LAWRENCE Sampling Date: 05/24/2012
Applicant/Owner: AEP State: KY Sampling Point: 05
Investigator(s): B. OTTO, M. THOMAYER, URS Section, Township, Range: ______
Landform (hillslope, terrace, etc.): TOE OF SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): ______
Subregion (LRR or MLRA): ______ Lat: 38.195745 Long: -82.637086 Datum: WGS 84
Soil Map Unit Name: OPF NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)
Are Vegetation N, Soil Y, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ______ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ______
Hydric Soil Present? Yes X No ______
Wetland Hydrology Present? Yes X No ______

Is the Sampled Area within a Wetland? **Yes** X **No** ______

Remarks:

PEM/PSS WETLAND THAT IS LOCATED AT TOE-OF-SLOPE & ABUTTING STREAM S-MOT5/24/12-06 (EPHEMERAL). SOILS WERE DISTURBED

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): 2 IN
Water Table Present? Yes ______ No X Depth (inches): —
Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): SURFACE

Wetland Hydrology Present? **Yes** X **No** ______

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

Remarks:

TOE-OF-SLOPE, ROADSIDE DITCH FLOW INTO WETLAND, & WETLAND IS ABUTTING EPHEMERAL STREAM

WETLAND 6

W-BAO-050412-05

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ________

Tree Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX NIGRA	20	X	OBL
2. PLANTUS OCCIDENTALIS	5		FACW
3.			
4.			
5.			
6.			
7.			
	25 = Total Cover		

Shrub Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1. JUNCUS effusus	15		FACW
2. SOLIDAGO spp.	10		FAC
3. Typha latifolia	15		OBL
4. Scirpus cyperinus	5		FACW
5. SCIRPUS atrovirens	35	X	FACW
6. JUNCUS tenius	30	X	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	110 = Total Cover		

Woody Vine Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
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: 3 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	35	x 1 = 35
FACW species	60	x 2 = 120
FAC species	40	x 3 = 120
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	135 (A)	(B)

Prevalence Index = B/A = 2.03

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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ____

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

WETLAND Q

W-BAO-052412-05

SOIL

Sampling Point: ____________

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8			* SEE	BELOW		*		

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

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☒ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ 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:

HYDRIC SOILS ASSUMED

* DISTURBED SOILS – GRAVELY, SANDY SILTY/CLAY WITH VARIOUS MOTTLING COLORS.

THE VARIOUS MOTTLING & UNSORTED GRAVEL ALLUVIUM WITH FRACTURED BEDROCK APPEARS DUE TO HISTORIC IMPACT

WETLAND 7

W-MDT-052412-06

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: AEP BIG SANDY City/County: LOUISA, LAWRENCE Sampling Date: 24, MAY 2012
Applicant/Owner: AEP State: KY Sampling Point:
Investigator(s): B. OTTO, M. THOMAYER Section, Township, Range:
Landform (hillslope, terrace, etc.): HILLSLOPE, SEEP Local relief (concave, convex, none): SLOPE Slope (%): 20
Subregion (LRR or MLRA): Lat: 38.182916 Long: -82.638806 Datum:
Soil Map Unit Name: UPF NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil *Y*, or Hydrology *Y* significantly disturbed? Are "Normal Circumstances" present? Yes ____ [✓ No]
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

Remarks:

PEM WETLAND WITH MINIMUM PSS LOCATED ON HILLSIDE. *FORMER BORROW AREA AREA THAT IS NOW A HILLSIDE SEEP.*

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)
- ☐ 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)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):
Water Table Present? Yes ____ No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): SURFACE

Wetland Hydrology Present? Yes X No

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

Remarks:

AREA IS A FORMER BORROW; IT HAS BEEN HIGHLY DISTURBED WHICH HAS CAUSED GROUNDWATER TO SEEP OUT BEDROCK.

WETLAND 7

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-MDT-052412-06

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX NIGRA	5	X	FACW
2. PLANTUS OCCIDENTALIS	5	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 = Total Cover		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. JUNCUS EFFUSUS	60	X	FACW
2. SCIRPUS CYPERINUS	20	X	FACW
3. SOLIDAGO SP.	10		FAC
4. ONOCLEA SENSIBILIS	2		FACW
5. Carex VULPINOIDEA	10		OBL
6. SCIRPUS ATROVIRENS	5		OBL
7. TYPHA LATIFOLIA	5		OBL
8. EUPATORIUM PURPUREUM	10		FAC
9. RUBUS ALLEGHENIENSIS	2		FACU
10.			
11.			
12.			
	124 = Total Cover		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	20	x 1 = 20
FACW species	92	x 2 = 184
FAC species	20	x 3 = 60
FACU species	2	x 4 = 8
UPL species		x 5 =
Column Totals:	134 (A)	272 (B)

Prevalence Index = B/A = 2.03

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Four Vegetation Strata:

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

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

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

WETLAND 7

SOIL

Sampling Point: W-MDT-052412-06

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8	DISTURBED						SILTY CLAY W/ A LOT OF GRAVEL	BEDROCK AT 8 in.

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- [✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**]
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ 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: BEDROCK

Depth (inches):

Hydric Soil Present? [✓ **Yes**] **No**

Remarks:

* SOILS WERE DISTURBED WITH VARIOUS MOTTLES & COLORS. LARGE AMOUNT OF GRAVEL W/IN SOILS & BEDROCK REFUSAL AT @ 8"

VARIOUS MOTTLES & UNSORTED GRAVEL WITH FRACTURED BEDROCK APPEAR DUE TO HISTORIC DISTURBACE

WETLAND 8

W-MBT-052412-07

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: AEP BIG SANDY City/County: LOUISA, LAWRENCE Sampling Date: 24, MAY 2012
Applicant/Owner: AEP State: KY Sampling Point: 7
Investigator(s): BOTTO, M. THOMAYER Section, Township, Range:
Landform (hillslope, terrace, etc.): HILLSLOPE, SEEP Local relief (concave, convex, none): SLOPE Slope (%): 20
Subregion (LRR or MLRA): Lat: 38.18342 Long: -82.638703 Datum:
Soil Map Unit Name: VaF NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes ___ [✓ No]
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

Remarks:

PEM WETLAND LOCATED ON HILLSIDE. *FORMER BORROW AREA THAT IS NOW A HILLSIDE SEEP.*

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):
Water Table Present? Yes ___ No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches):

Wetland Hydrology Present? Yes ✓ No

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

Remarks:

AREA IS A FORMER BORROW AREA; IT HAS BEEN HIGHLY DISTURBED WHICH HAS CAUSED GROUNDWATER TO SEEP OUT OF BEDROCK.

WETLAND 8

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-MDT-052412-07

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		

Herb Stratum (Plot size: ______)			
1. JUNCUS EFFUSUS	45	X	FACW
2. SCIRPUS ATROVIRENS	30	X	FACW
3. CAREX VULPINOIDEA	10		OBL
4. JUNCUS TENUIS	5		FAC
5. SOLIDAGO SP.	10		FAC
6. EUPATORIUM PURPUREUM	2		FAC
7. LUDWIGIA ALTERNIFOLIA	2		FACW
8. Symphyotrichum puniceum	5		FACW
9.			
10.			
11.			
12.			
	109 = Total Cover		

Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	10	x 1 = 10
FACW species	82	x 2 = 164
FAC species	17	x 3 = 51
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	109 (A)	225 (B)

Prevalence Index = B/A = 2.06

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.

Definitions of Four Vegetation Strata:

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

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

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

WETLAND 8

SOIL

Sampling Point: W-MDT-052412-07

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
*	SEE BELOW		*					

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

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☑ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ 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: BEDROCK

Depth (inches): 4-6"

Hydric Soil Present? Yes X **No**

Remarks:

* SOILS WERE HIGHLY DISTURBED WITH VARING COLORS * AND BEDROCK REFUSAL WAS at 4-6"

THE VARIOUS MOTTLING & UNSORTED GRAVEL ALLUVIUM WITH FRACTURED BEDROCK APPEAR DUE TO HISTORIC DISTURBANCE

W- mdt 6/5/2012 - 1
Wetland 9

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP Big Sandy Pond Closure City/County: Louisa, Lawrence Sampling Date: 06/05/12
Applicant/Owner: AEP State: KY Sampling Point: 01
Investigator(s): MDT, PR Section, Township, Range: ______
Landform (hillslope, terrace, etc.): base of rock face Local relief (concave, convex, none): ______ Slope (%): ______
Subregion (LRR or MLRA): ______ Lat: 38.185936 Long: -82.635573 Datum: ______
Soil Map Unit Name: Dm, VaF2 NWI classification: n/a
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)
Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ______
Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ______
Hydric Soil Present? Yes X No ______
Wetland Hydrology Present? Yes X No ______

Is the Sampled Area within a Wetland? Yes X No ______

Remarks: PEM/PSS wetland at base of cut rock face. Previously disturbed from pond construction.

HYDROLOGY

Wetland Hydrology Indicators:

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

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
X Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ 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)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ______
Water Table Present? Yes ______ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ______

Wetland Hydrology Present? Yes X No ______

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

Remarks:

Wetland receives hydrology from two streams to the west and sheet flow off the hillsides to the north.

mor 6/3/2012-1
Wetland 9

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. (none)			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. (none)			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	30	yes	OBL
2. Sycamore	15	yes	FACW
3.			
4.			
5.			
6.			
7.			
	45 = Total Cover 9/22.5		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juncus effusus	40	yes	FACW
2. Typha angustifolia	50	yes	OBL
3. fox sedge - C. vulpinoidea	20	no	OBL
4. Tapertip rush - J. acuminatus	30	no	OBL
5. C. squarrosa	15	no	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	155 = Total Cover 31/77.5		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. (none)			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	130	x 1 =	130	
FACW species	70	x 2 =	140	
FAC species	0	x 3 =		
FACU species		x 4 =		
UPL species		x 5 =		
Column Totals:	200	(A)	270	(B)

Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ____

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

W-MOT 6/5/2012-1
Wetland 9

SOIL

Sampling Point: ____________

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8"	10YR 6/2	70	10YR 4/6	30	C	M	Sandy clay	restrictive sand/rock layer

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 136, 122)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (TF2)
___ 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): 8"

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:

W-PR 6/7/2012-1
Wetland 10

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP Big Sandy Pond Closure Project City/County: Louisa, Lawrence Sampling Date: 06/07/12
Applicant/Owner: AEP State: KY Sampling Point: 01
Investigator(s): MDT, PR Section, Township, Range: ____
Landform (hillslope, terrace, etc.): Along landfill outfall Local relief (concave, convex, none): ____ Slope (%): ____
Subregion (LRR or MLRA): ____ Lat: 38.187993 Long: -82.633528 Datum: ____
Soil Map Unit Name: VaF2 NWI classification: n/a
Are climatic / hydrologic conditions on the site typical for this time of year? [✓ Yes] No ____ (If no, explain in Remarks.)
Are Vegetation no, Soil yes, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? [✓ Yes] No ____
Are Vegetation no, Soil no, or Hydrology no 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 ____
Wetland Hydrology Present? [✓ Yes] No ____

Is the Sampled Area within a Wetland? [✓ Yes] No ____

Remarks: PEM wetland that parallels landfill outfall. Portion of wetland extends up slope as well.

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)
- 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)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- [✓ Drainage Patterns (B10)]
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- [✓ 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): 6

Wetland Hydrology Present? [✓ Yes] No ____

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

Remarks:
Wetland abuts landfill outfall.

W-pr 6/7/2012-1
Wetland 10

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ______)			
1. Typha latifolia	70	yes	OBL
2. Typha angustifolia	30	yes	OBL
3. Fox sedge	15	no	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	115 = Total Cover		
	23/57.5		

Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
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: 3 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	115	x 1 = 115
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	115 (A)	115 (B)

Prevalence Index = B/A = 1

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

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SOIL

Sampling Point: ______

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-9"	10YR 6/2	70	10YR 4/6	30	C	M	silty clay	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ______

Remarks:

W-pr 6/7/2012 - 2
Wetland 11

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP Big Sandy Pond Closure Project City/County: Louisa, Lawrence Sampling Date: 06/07/12

Applicant/Owner: AEP State: KY Sampling Point: 02

Investigator(s): MDT, PR Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR or MLRA): ______ Lat: 38 187827 Long: -82. 632687 Datum: ______

Soil Map Unit Name: Dm NWI classification: n/a

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

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

Are Vegetation NO Soil No, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ___
Hydric Soil Present? Yes X No ___
Wetland Hydrology Present? Yes X No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks: PEM wetland

HYDROLOGY

Wetland Hydrology Indicators:

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

X Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
X Water Marks (B1)
X Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ 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)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1
Water Table Present? Yes ___ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4

Wetland Hydrology Present? Yes X **No** ___

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

Remarks:

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wetland 11

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ___________

Tree Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Sapling Stratum (Plot size: ________)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Shrub Stratum (Plot size: ________)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: ________)			
1. Typha latifolia	70	Yes	OBL
2. Carex vulpinoidea	15	N.	OBL
3. Typha angustifolia	15	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	20 50

Woody Vine Stratum (Plot size: ________)			
1.			
2.			
3.			
4.			
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: 3 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = 1

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

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Wetland 11

SOIL

Sampling Point: ____________

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-9	10YR 6/2	70	10YR 4/6	30	C	M	silty clay	

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

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes X No ______

Remarks:

W-PR 6/7/2012 - 3
Wetland 12

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP Big Sandy Pond Closure Project City/County: Louisa/Lawrence Sampling Date: 06/07/12
Applicant/Owner: AEP State: KY Sampling Point: 03
Investigator(s): MDT, PR Section, Township, Range: ______
Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): Concave Slope (%): ______
Subregion (LRR or MLRA): ______ Lat: 38.188183 Long: -82.631769 Datum: ______
Soil Map Unit Name: Dm NWI classification: n/a
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)
Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ______
Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ______
Hydric Soil Present? Yes X No ______
Wetland Hydrology Present? Yes X No ______

Is the Sampled Area within a Wetland? **Yes** X **No** ______

Remarks: PEM wetland located in former landfill outfall.

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)
- ☐ 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)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ______
Water Table Present? Yes ______ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ______

Wetland Hydrology Present? Yes X **No** ______

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

Remarks: Algal mat and surface cracks noted.

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wetland 12

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ____________

Tree Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	1	yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	1 = Total Cover		

Herb Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carex lurida	5	no	OBL
2. Carex vulpinoidea	15	yes	OBL
3. Moneywort - L. nummularia	40	yes	FACW
4. Rumex crispus	1	no	FAC
5. Boneset - E. perfoliatum	3	no	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	64 = Total Cover 12.8/32		

Woody Vine Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
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: 3 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	21	x 1 = 21
FACW species	43	x 2 = 86
FAC species	1	x 3 = 3
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	65 (A)	110 (B)

Prevalence Index = B/A = 1.69

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ____

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

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Wetland 12

SOIL

Sampling Point: ____________

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 6/1	70	10YR 4/6	30	C	M	silty clay	

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 136, 122)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ____________________
Depth (inches): ____________________

Hydric Soil Present? Yes _X_ No ______

Remarks:

W-pr 6/7/2012-4
Wetland 13

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP Big Sandy Pond Closure City/County: Louisa, Lawrence Sampling Date: 06/07/12
Applicant/Owner: AEP State: KY Sampling Point: D4
Investigator(s): MDT, PR Section, Township, Range: ______
Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______
Subregion (LRR or MLRA): ______ Lat: 38.187824 Long: -82.631001 Datum: ______
Soil Map Unit Name: Dm NWI classification: n/a
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)
Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ______
Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: PEM wetland provided with water from seeps in dam.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): 3
Water Table Present? Yes ______ No ______ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): 2

Wetland Hydrology Present? Yes X No ______

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

Remarks:

w-pr 6/7/2012-4
Wetland 13

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ______)			
1. Carex lupulina	30	yes	OBL
2. Canada goldenrod	5	no	FACU
3. Eupatorium maculatum	5	no	FACW
4. Eleocaris acicularis	10	no	OBL
5. Typha angustifolia	0	no	OBL
6. Tapertip rush (Juncus acuminatus)	20	yes	OBL
7. Carex scoparia	3	no	FACW
8.			
9.			
10.			
11.			
12.			
	73 = Total Cover		
	14.6 / 36.5		

Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	60	x 1 = 60
FACW species	8	x 2 = 16
FAC species	0	x 3 = 0
FACU species	5	x 4 = 20
UPL species		x 5 =
Column Totals:	73 (A)	96 (B)

Prevalence Index = B/A = 1.32

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ____

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

w pr 6/7/2012 - 4
wetland 13

SOIL

Sampling Point: ___________

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8	10YR 6/2	70	10YR 4/6	30	C	M	silty clay	

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

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ___________

Depth (inches): ___________

Hydric Soil Present? Yes X No ______

Remarks:

WETLAND 14

W-MDT-101512-01

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY POND CLOSURE City/County: LOUISA, LAWRENCE Sampling Date: 10/15/12
Applicant/Owner: AEP State: KY Sampling Point: ___
Investigator(s): BAO, MDT Section, Township, Range: ___
Landform (hillslope, terrace, etc.): TOE OF SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): —
Subregion (LRR or MLRA): ___ Lat: 38.179076 Long: -82.625342 Datum: ___
Soil Map Unit Name: DM, ShF NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ___
Hydric Soil Present? Yes X No ___
Wetland Hydrology Present? Yes X No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks:

PEM/PSS WETLAND LOCATED AT TOE-OF-SLOPE WITH STREAM & DAM OUTFALL PROVIDING ADDITIONAL HYDROLOGY
* WETLAND SOILS OBSERVED IMPACTED BY AMD

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 3"
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): SURFACE

Wetland Hydrology Present? Yes X **No** ___

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

Remarks:

WETLAND IS LOCATED AT TOE OF SLOPE
EPHEMERAL STREAM FLOWS INTO WETLAND
DAM OUTFALL ALSO PROVIDES ADDITIONAL HYDROLOGY

W-MPT-101512-01

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX NIGRA	10	X	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	

Sapling Stratum (Plot size: ______)			
1. SALIX NIGRA	10	X	OBL
2. FRAXINUS OCCIDENTALIS	10		FACW
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Shrub Stratum (Plot size: ______)			
1. Rosa palustris	2	X	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	2	= Total Cover	

Herb Stratum (Plot size: ______)			
1. SWEET FLAG – Acorus calamus	30	X	OBL
2. TURTLEHEAD – Chelone glabra	15		FACW
3. SEEDBOX – Ludwigia alternifolia	30	X	FACW
4. DEERTONGUE – Dicanthelium clandestinum	10		FAC
5. FALSE NETTLE – Buehmeria cylindrica	5		FACW
6. SCIRPUS CYPERINUS	2		FACW
7. TYPHA ANGUSTIFOLIA	2		OBL
8. Impatiens capensis	5		FACW
9. Carex spp.	5		FAC
10. JAPANESE STILT GRASS – M. vimineum	5		NI
11. BIDENS SPP.	5		FAC
12. SENSITIVE fern – Onoclea sensibilis	2		FACW
	116	= Total Cover	

Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	54	x 1 =	54
FACW species	69	x 2 =	138
FAC species	25	x 3 =	75
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	148 (A)		267 (B)

Prevalence Index = B/A = 1.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ______

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

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SOIL

Sampling Point: ____________

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 5/1	90	10YR 5/6	10	RM	M	SILTY CLAY	

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

Hydric Soil Indicators:

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
X Hydrogen Sulfide (A4)
__ Stratified Layers (A5)
__ 2 cm Muck (A10) **(LRR N)**
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Dark Surface (S7)
__ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
__ Thin Dark Surface (S9) **(MLRA 147, 148)**
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
__ Umbric Surface (F13) **(MLRA 136, 122)**
__ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

__ 2 cm Muck (A10) **(MLRA 147)**
__ Coast Prairie Redox (A16) **(MLRA 147, 148)**
__ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
__ Red Parent Material (TF2)
__ 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:

OBSERVED AREAS OF MUCK & SOILS IMPACTED BY AMD.

WETLAND 15

W-MDT-101512-02

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY POND CLOSURE City/County: LOUISA, LAWRENCE Sampling Date: 10/15/12
Applicant/Owner: AEP State: KY Sampling Point: 02
Investigator(s): BAO, MDT Section, Township, Range: ______
Landform (hillslope, terrace, etc.): TOE OF SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): —
Subregion (LRR or MLRA): ______ Lat: 38.179389 Long: -82.625917 Datum: ______
Soil Map Unit Name: Du NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ______
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ______
Hydric Soil Present? Yes X No ______
Wetland Hydrology Present? Yes X No ______

Is the Sampled Area within a Wetland? **Yes** X **No** ______

Remarks:

PEM WETLAND THAT IS CONNECTED TO DAM OUTFALL STREAM & IMPACTED BY AMD

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): 2"
Water Table Present? Yes ______ No X Depth (inches): —
Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): SURFACE

Wetland Hydrology Present? **Yes** X **No** ______

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

Remarks:

W-MPT-101512-02

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ____________

Tree Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Shrub Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha angustifolia	90	X	OBL
2. Redroot Flatsedge - Cyperus erythrorhizos	20		FACW
3. Scirpus cyperinus	5		FACW
4. Needle spikerush - Eleocharis acicularis	20		OBL
5. Bidens spp.	5		FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	120 = Total Cover		

Woody Vine Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	110	x 1 =	110
FACW species	25	x 2 =	50
FAC species	5	x 3 =	15
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	120 (A)		175 (B)

Prevalence Index = B/A = 1.45

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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

LW-MDT-101512-02

SOIL

Sampling Point: ____________

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
	* SEE	BELOW *		SOILS	ASSUMED		*	

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

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) (**LRR N**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**MLRA 147, 148**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- ☐ Umbric Surface (F13) (**MLRA 136, 122**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) (**MLRA 147, 148**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- ☐ Red Parent Material (TF2)
- ☐ 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:

* SOILS ASSUMED HYDRIC AS THEY ARE * SEVERLY DISTURBED BY AMD. & INUNDATED

THE PRESENCE OF AMD materials OVERLYING UNSORTED ALLUVIAL GRAVEL & FRACTURED BEDROCK MATERIAL. SOIL LACKS SIGNIFICANT ORGANIC MATTER IN UPPER LAYERS. SOIL SATURATED AT SURFACE

WETLAND 10

W-MDT-101512-03

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDY POND CLOSURE City/County: LOUISA, LAWRENCE Sampling Date: 10/15/12

Applicant/Owner: AEP State: KY Sampling Point: 03

Investigator(s): BAD, MDT Section, Township, Range: ______

Landform (hillslope, terrace, etc.): TOE-OF-SLOPE Local relief (concave, convex, none): NONE Slope (%): ______

Subregion (LRR or MLRA): ______ Lat: 38.179511 Long: -82.624805 Datum: ______

Soil Map Unit Name: ShF NWI classification: NA

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

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

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

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

Hydrophytic Vegetation Present? Yes X No ______

Hydric Soil Present? Yes X No ______

Wetland Hydrology Present? Yes X No ______

Is the Sampled Area within a Wetland? Yes X No ______

Remarks:

PEM/PSS WETLAND LOCATED AT TOE-OF-SLOPE & WITHIN FORMERLY DISTURBED AREA

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ______

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

Remarks:

SATURATION PRESENT IN AREAS OF WETLAND

W- MDT- 101512 - 03

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: ______

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling Stratum (Plot size: ______)			
1. SALIX NIGRA	20	X	OBL
2. FRAXINUS OCCIDENTALIS	25	X	FACW
3.			
4.			
5.			
6.			
7.			
	45 = Total Cover		

Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: ______)			
1. Typha latifolia	20		OBL
2. JUNCUS effusus	5		FACW
3. Carex vulpinoidea	60	x	OBL
4. TURTLEHEAD - Chelone glabra	10		OBL
5. SEEDBOX - Ludwigia alternifolia	35	X	FACW
6. SOLIDAGO spp.	20		FAC
7.			
8.			
9.			
10.			
11.			
12.			
	150 = Total Cover		

Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	110	x 1 =	110
FACW species	65	x 2 =	130
FAC species	20	x 3 =	60
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	195 (A)		300 (B)

Prevalence Index = B/A = 1.54

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

W-MOT-101512-03

SOIL

Sampling Point: ___________

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-10	10YR 5/1	80	10YR 5/6	20	RM	M	Silty clay	GRAVEL OBSERVED

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) (**LRR N**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
___ Thin Dark Surface (S9) (**MLRA 147, 148**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
___ Umbric Surface (F13) (**MLRA 136, 122**)
___ Piedmont Floodplain Soils (F19) (**MLRA 148**)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) (**MLRA 147**)
___ Coast Prairie Redox (A16) (**MLRA 147, 148**)
___ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
___ Red Parent Material (TF2)
___ 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:

WETLAND 17

W-MDT-101512-04

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: AEP BIG SANDY City/County: LOUISA, LAWRENCE Sampling Date: 15, OCT. 2012
Applicant/Owner: AEP State: KY Sampling Point:
Investigator(s): B. OTTO, M. THOMAYER, URS Section, Township, Range:
Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): CONCAVE Slope (%):
Subregion (LRR or MLRA): Lat: Long: Datum:
Soil Map Unit Name: GF NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

PFO WETLAND LOCATED ALONG STREAM 4 WITHIN A STREAM VALLEY.
SOILS WERE NOTED AS WITH A SANDY LOAM.

HYDROLOGY

Wetland Hydrology Indicators:

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

__ Surface Water (A1)
__ High Water Table (A2)
X Saturation (A3)
__ Water Marks (B1)
__ Sediment Deposits (B2)
__ Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
__ Inundation Visible on Aerial Imagery (B7)
X 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)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):
Water Table Present? Yes ___ No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): SURFACE

Wetland Hydrology Present? Yes X **No**

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

Remarks:

WETLAND IS LOCATED ABUTTING STREAM 4.

WETLAND 17

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-MDT-101512-04

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. RIVER BIRCH - BETula nigra	25	X	FACW
2. SILVERMAPLE Acer Saccharium	15		FACW
3. Sycamore - PlantUS OCCIDENtalis	40	X	FACW
4. Am. Elm - ULMUS AMERICANA	5		FACW
5. GR. ASH - FRAXINUS Pennsylvanicum	5		FACW
6. BLK WILLOW - SALIX NIGRA	5		OBL
7.			
8.			
	95 = Total Cover		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. SPICE BUSH - LINDERA benzoin	20	X	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20 = Total Cover		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. WHITEGRASS - Leersia Virginica	70	X	FACW
2. POLYGONUM PENNSYLVANICUM	40	X	FACW
3. BIDENS SPP. -	10		FAC
4. FALSE NETTLE - Boehmeria cylindrica	5		FACW
5. SENSITIVE FERN - Onoclea sensibilis	5		FACW
6. Poison Ivy - Toxicohedron radicans	10		FAC
7. DEER TONGUE - Dischanthelium clandestinum	2		FAC
8. SOLIDAGO SPP	5		FAC
9.			
10.			
11.			
12.			
	147 = Total Cover		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	______ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	5	x 1 = 5
FACW species	210	x 2 = 420
FAC species	47	x 3 = 141
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	262 (A)	566 (B)

Prevalence Index = B/A = 2.16

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Four Vegetation Strata:

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

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

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

WETLAND 17

SOIL

Sampling Point: W-MDT-10156-04

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 5/2	70	10YR 4/6	30	RM	M	SANDY LOAM	
4-12	10YR 5/1	80	10YR 4/6	20	RM	M	SANDY LOAM	

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

Hydric Soil Indicators:

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10) **(LRR N)**
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
☐ Umbric Surface (F13) **(MLRA 136, 122)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

☐ 2 cm Muck (A10) **(MLRA 147)**
☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks:

APPENDIX B

OHIO EPA WETLAND ORAM FORMS

WETLAND 1

ORAM v. 5.0 Field Form Quantitative Rating

W-bao5/23/12-1

Site: AEP Big Sandy Pond Closure	Rater(s): M. Thomayer, B. Otto	Date: 5/23/12

max 6 pts.	subtotal
0	0

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

max 14 pts.	subtotal
6	6

Metric 2. Upland buffers and surrounding land use.

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

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

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

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

max 30 pts.	subtotal
8	14

Metric 3. Hydrology.

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

☐ High pH groundwater (5)
☐ Other groundwater (3)
1 ☒ Precipitation (1)
☐ 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)
0 ☐ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

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

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

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

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

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

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

Check all disturbances observed

☒ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☒ road bed/RR track
☐ dredging
☐ other

max 20 pts.	subtotal
6	20

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

☐ mowing
☐ grazing
☒ clearcutting
☒ selective cutting
☐ woody debris removal
☐ toxic pollutants
☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☒ sedimentation
☒ dredging
☐ farming
☐ nutrient enrichment

subtotal this page
20

WETLAND 1

ORAM v. 5.0 Field Form Quantitative Rating W-Bao 5/23/12-1

Site:	Rater(s):	Date:

20
subtotal first page

0 | 20
max 10 pts. | subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

3 | 23
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

2

- ☐ Aquatic bed
- 2 Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other________________

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

0

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

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

0

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

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

1

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

Category 1

23

End of Quantitative Rating. Complete Categorization Worksheets.

WETLAND2

ORAM v. 5.0 Field Form Quantitative Rating

W-bao 5/23/12-Z

Site: AEP Big Sandy Pond Closure **Rater(s):** M. Thonayer, B. Otto UMS **Date:** 23, May 2012

Metric 1. Wetland Area (size).

max 6 pts.	subtotal
0	0

Select one size class and assign score.
- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0 ☐ 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)

Metric 2. Upland buffers and surrounding land use.

max 14 pts.	subtotal
6	6

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)
- 1 ☒ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

Metric 3. Hydrology.

max 30 pts.	subtotal
8	14

3a. Sources of Water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- 1 ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 (27.6in) (3)
- 1 ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3b. Connectivity. Score all that apply.
- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- 0 ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- 1 ☐ 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)
- 5 ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☒ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☐ other ______

Metric 4. Habitat Alteration and Development.

max 20 pts.	subtotal
6	20

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☐ Recovered (3)
- 2 ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- 1 ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- 3 ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☒ clearcutting
- ☒ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☒ sedimentation
- ☒ dredging
- ☐ farming
- ☐ nutrient enrichment

subtotal this page
20

last revised 1 February 2001 jjm

WETLAND2

ORAM v. 5.0 Field Form Quantitative Rating

10-690 5/23/12 - 2

Site:	**Rater(s):**	**Date:**

20
subtotal first page

0 | 20
max 10 pts. | subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

3 | 23
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

2
☐ Aquatic bed
☑ Emergent
☐ Shrub
☐ Forest
☐ Mudflats
☐ Open water
☐ Other__________________

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

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

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

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

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

1
1 Vegetated hummucks/tussucks
0 Coarse woody debris >15cm (6in)
0 Standing dead >25cm (10in) dbh
0 Amphibian breeding pools

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

23

Category 1

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 3

Site: W-MDT-052412-01 **Rater(s):** BAO, MDT **Date:** 2012, MAY24

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.
☐ >50 acres (>20.2ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
☒ <0.1 acres (0.04ha) (0 pts)

3	3
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

10	13
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.
☐ High pH groundwater (5)
☒ Other groundwater (3)
4 ☒ Precipitation (1)
☐ 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)
0 ☐ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
☐ >0.7 (27.6in) (3)
1 ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
☒ <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.
☐ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3)
2 ☑ 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)
☐ Recovered (7)
3 ☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☒ other EXCAVATION

7	20
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.
☐ None or none apparent (4)
☐ Recovered (3)
2 ☒ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☐ Moderately good (4)
2 ☐ Fair (3)
☒ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
☐ None or none apparent (9)
3 ☐ Recovered (6)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☐ mowing
☐ grazing
☒ clearcutting
☐ selective cutting
☐ woody debris removal
☐ toxic pollutants
☒ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☒ dredging
☐ farming
☐ nutrient enrichment

20
subtotal this page

last revised 1 February 2001 jjm

WETLANDS 3

ORAM v. 5.0 Field Form Quantitative Rating

Site: MDT-052412-01	**Rater(s):** BAO, MDT	**Date:** 052412

20
subtotal first page

max 10 pts.	subtotal
0	20

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

max 20 pts.	subtotal
2	22

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)
- ☐ Low (1)
- ☒ None (0)

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

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

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

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

Category 1

22

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 4

Site: W-MDT-052412-02	**Rater(s):** BAO, MDT	**Date:** 052412

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.
☐ >50 acres (>20.2ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
☐ <0.1 acres (0.04ha) (0 pts)

3	4
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

11	15
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.
☐ High pH groundwater (5)
4 ☒ Other groundwater (3)
☒ Precipitation (1)
☐ 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)
☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
☐ >0.7 (27.6in) (3)
1 ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
☒ <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.
☐ Semi- to permanently inundated/saturated (4)
☒ Regularly inundated/saturated (3) - Sp. moss
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)
3 ☐ Recovered (7)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☒ other EXCAVATION

7	22
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.
☐ None or none apparent (4)
☐ Recovered (3)
☒ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☐ Moderately good (4)
☐ Fair (3)
☒ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
☐ None or none apparent (9)
☐ Recovered (6)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☐ mowing
☐ grazing
☒ clearcutting
☐ selective cutting
☐ woody debris removal
☐ toxic pollutants
☒ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☒ dredging
☐ farming
☐ nutrient enrichment

22
subtotal this page

Wetland 4

ORAM v. 5.0 Field Form Quantitative Rating

Site: W-MDT-052412-02	**Rater(s):** BAO, MDT	**Date:** 052412

22
subtotal first page

0	22
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

1	23
max 20 pts.	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)
☐ Low (1)
☒ None (0)

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

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

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

☐ Vegetated hummucks/tussucks
☐ Coarse woody debris >15cm (6in)
☐ Standing dead >25cm (10in) dbh
☐ Amphibian breeding pools

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

23

Category 1

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 5

Site: W-MDT-052412-03	**Rater(s):** BAO, MDT	**Date:** 2012, MAY 24

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.
☐ >50 acres (>20.2ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
☐ <0.1 acres (0.04ha) (0 pts)

3	4
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

11	15
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.
☐ High pH groundwater (5)
☒ Other groundwater (3)
4 ☒ Precipitation (1)
☐ Seasonal/Intermittent surface water (3)
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.
☐ >0.7 (27.6in) (3)
☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
☒ <0.4m (<15.7in) (1)

3b. Connectivity. Score all that apply.
☐ 100 year floodplain (1)
☐ Between stream/lake and other human use (1)
☐ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.
☐ Semi- to permanently inundated/saturated (4)
☒ Regularly inundated/saturated (3)
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)
☐ Recovered (7)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☒ other EXCAVATION

7	22
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.
☐ None or none apparent (4)
☐ Recovered (3)
☒ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☐ Moderately good (4)
☐ Fair (3)
☒ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
☐ None or none apparent (9)
☐ Recovered (6)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☐ mowing
☐ grazing
☒ clearcutting
☐ selective cutting
☐ woody debris removal
☐ toxic pollutants
☒ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☒ dredging/EXCAVATION
☐ farming
☐ nutrient enrichment

22
subtotal this page

last revised 1 February 2001 jjm

WETLAND 5

ORAM v. 5.0 Field Form Quantitative Rating

Site: W-MDT-052412-03	**Rater(s):** BAO, MDT	**Date:** 2012, May 24

22
subtotal first page

0 | 22
max 10 pts. | subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

2 | 24
max 20 pts. | 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)
- ☐ Low (1)
- ☒ None (0)

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

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

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

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

Category 1

24

End of Quantitative Rating. Complete Categorization Worksheets.

WETLAND 6

ORAM v. 5.0 Field Form Quantitative Rating

w-mdt 5/24/12-5

Site: AEP Big Sandy	Rater(s): M. Thoneyer, B. Otto	Date: 24 May 2012

max 6 pts.	subtotal
0	0

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

max 14 pts.	subtotal
9	9

Metric 2. Upland buffers and surrounding land use.

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

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

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

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

max 30 pts.	subtotal
14	23

Metric 3. Hydrology.

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

☐ High pH groundwater (5)
☐ Other groundwater (3)
4 ☒ Precipitation (1)
☒ 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)
1 ☒ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

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

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

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

☐ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3)
☐ Seasonally inundated (2)
1 ☒ 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)
7 ☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☒ road bed/RR track
☐ dredging
☐ other ________

max 20 pts.	subtotal
9	32

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed
☐ mowing
☐ grazing
☒ clearcutting
☒ selective cutting
☐ woody debris removal
☐ toxic pollutants
☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☒ sedimentation
☐ dredging
☐ farming
☐ nutrient enrichment

subtotal this page
32

last revised 1 February 2001 jjm

WETLAND 6

ORAM v. 5.0 Field Form Quantitative Rating

W-MD+5/24/12-5

Site: AEP Big Sandy	**Rater(s):**	**Date:**

32
subtotal first page

0	32
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

8	40
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

4

- ☐ Aquatic bed
- 3 Emergent
- 1 Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other_______________

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

1

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

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

0

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

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

3

- 2 Vegetated hummucks/tussucks
- 1 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 0 Amphibian breeding pools

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

Category 2

40

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 7

Site: W-MDT-052412-06	**Rater(s):** B. OTTO, M. THOMAYER	**Date:** 052412

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

7	7
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

3
☐ 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)
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

12	19
max 30 pts.	subtotal

Metric 3. Hydrology.

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

4
☐ High pH groundwater (5)
☒ Other groundwater (3)
☒ Precipitation (1)
☐ Seasonal/Intermittent surface water (3)
☐ Perennial surface water (lake or stream) (5)

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

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

3b. Connectivity. Score all that apply.

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

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

3
☐ Semi- to permanently inundated/saturated (4)
☒ 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.

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

Check all disturbances observed

☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input

☐ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☒ other BORROW AREA

7.5	26.5
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

1.5
☐ None or none apparent (4)
☐ Recovered (3)
☒ Recovering (2)
☒ Recent or no recovery (1)

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

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

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

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

Check all disturbances observed

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

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

26.5
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 7

Site: W-MDF-052412-06 | **Rater(s):** B, OTTO, M. THOMAYER | **Date:** 24, MAY 2012

26.5
subtotal this page

0 | 26.5

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 1 Qualitative Rating (-10)

2 | 28.5

max 20 pts | subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

2

☐ Aquatic bed
2 Emergent
☐ Shrub
☐ Forest
☐ Mudflats
☐ Open water
☐ Other________________

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

1

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

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

-1

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

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

0

☐ Vegetated hummucks/tussucks
☐ Coarse woody debris >15cm (6in)
☐ Standing dead >25cm (10in) dbh
☐ Amphibian breeding pools

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

cat. 1

28.5 GRAND TOTAL(max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 8

Site: W-MDT-052412-07 | **Rater(s):** B. OTTO, M. THOMAYER | **Date:** 24 MAY 2012

Metric 1. Wetland Area (size).

max 6 pts. 0 | subtotal 0

Select one size class and assign score.

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

Metric 2. Upland buffers and surrounding land use.

max 14 pts. 7 | subtotal 7

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

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

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

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

Metric 3. Hydrology.

max 30 pts. 10 | subtotal 17

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

☐ High pH groundwater (5)
☒ Other groundwater (3)
4 ☒ Precipitation (1)
☐ 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)
1 ☒ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

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

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

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

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

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

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

Check all disturbances observed

☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☒ other BORROW AREA

Metric 4. Habitat Alteration and Development.

max 20 pts. 7.5 | subtotal 24.5

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

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

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

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

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

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

Check all disturbances observed

☐ mowing
☐ grazing
☒ clearcutting
☐ selective cutting
☐ woody debris removal
☐ toxic pollutants
☒ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☒ dredging
☐ farming
☐ nutrient enrichment

24.5
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 8

Site: W-MOT-052412-07 | **Rater(s):** B. OTTO, M. THOMAYER | **Date:** 24, MAY 2012

24.5
subtotal this page

0	24.5
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 1 Qualitative Rating (-10)

3	27.5
max 20 pts	subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

2

- ☐ Aquatic bed
- 2 Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other_________________

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

0

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

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

1

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

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

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

27.5 GRAND TOTAL(max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address http://www.epa.state.oh.us/dsw/401/401.html

WETLAND 9

ORAM v. 5.0 Field Form Quantitative Rating

W-ndt 6/5/2012-1

Site: AEP BIG SANDY	**Rater(s):** M. Thomayer, B. Otto	**Date:** 06/05/12

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

3	3
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

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

8	11
max 30 pts.	subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- 1 ☒ Precipitation (1)
- ☐ 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)
- 0 ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

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

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

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

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- 1 ☐ 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)
- ☒ Recovered (7)
- 5 ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☐ road bed/RR track
- ☒ dredging
- ☐ other ______

6	17
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

17
subtotal this page

last revised 1 February 2001 jjm

WETLAND 9

w-md46/5/12-1

Site:	**Rater(s):**	**Date:**

17
subtotal first page

0	17
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

7	24
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

☐ Aquatic bed
3 Emergent
4 1 Shrub
☐ Forest
☐ Mudflats
☐ Open water
☐ Other________________

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

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

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

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

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

1 Vegetated hummucks/tussucks
0 Coarse woody debris >15cm (6in)
2 0 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	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

24

Category 1

End of Quantitative Rating. Complete Categorization Worksheets.

WETLAND 10

ORAM v. 5.0 Field Form Quantitative Rating

W-pr 6/7/12-1

Site:	Rater(s):	Date:

Metric 1. Wetland Area (size).

max 6 pts. 0 | subtotal 0

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)
- o ☐ 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)

Metric 2. Upland buffers and surrounding land use.

max 14 pts. 1 | subtotal 1

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)
- 0 ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

Metric 3. Hydrology.

max 30 pts. 16 | subtotal 17

3a. Sources of Water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- 6 ☐ Seasonal/Intermittent surface water (3)
- ☒ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- 1 ☒ <0.4m (<15.7in) (1)

3b. Connectivity. Score all that apply.
- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- 1 ☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- 1 ☒ 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)
- 7 ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☐ other ________

Metric 4. Habitat Alteration and Development.

max 20 pts. 7 | subtotal 24

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- 3 ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- 1 ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- 3 ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☒ mowing
- ☐ grazing
- ☒ clearcutting
- ☒ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☒ sedimentation
- ☒ dredging
- ☐ farming
- ☐ nutrient enrichment

24 subtotal this page

WETLAND 10

ORAM v. 5.0 Field Form Quantitative Rating

w-pr 6/7/12-1

Site: AEP BIG SANDY | **Rater(s):** PADI, BRAD | **Date:** 06/07/12

24
subtotal first page

0 | 24
max 10 pts. | subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

-1 | 23
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

- ☐ Aquatic bed
- 2 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)
- ☐ Low (1)
- 0 ☒ None (0)

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

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

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

- 0 Vegetated hummucks/tussucks
- 0 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 0 Amphibian breeding pools

0

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

Category I

23

End of Quantitative Rating. Complete Categorization Worksheets.

WETLAND 11

ORAM v. 5.0 Field Form Quantitative Rating

W-P1 6/7/12-2

Site:	AEP Big Sandy	**Rater(s):**	MDT, BA	**Date:**	06/07/12

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.
☐ >50 acres (>20.2ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
0 ☐ 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)

2	2
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
0 ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

13	15
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.
☐ High pH groundwater (5)
☐ Other groundwater (3)
☒ Precipitation (1)
4 ☒ 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)
0 ☐ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
☐ >0.7 (27.6in) (3)
1 ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
☒ <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.
☐ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3)
☐ Seasonally inundated (2)
1 ☒ 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)
7 ☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☒ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☒ road bed/RR track
☒ dredging
☐ other ____________

7	22
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.
☐ None or none apparent (4)
3 ☒ Recovered (3)
☐ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☐ Moderately good (4)
☐ Fair (3)
1 ☐ Poor to fair (2)
☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.
☐ None or none apparent (9)
3 ☐ Recovered (6)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed
☒ mowing
☐ grazing
☒ clearcutting
☐ selective cutting
☐ woody debris removal
☐ toxic pollutants
☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☒ sedimentation
☒ dredging
☐ farming
☐ nutrient enrichment

22
subtotal this page

last revised 1 February 2001 jjm

WETLAND 11

ORAM v. 5.0 Field Form Quantitative Rating

w-pr 6/7/12-2

Site:	**Rater(s):**	**Date:**

22
subtotal first page

0	22
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

1	23
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

2

- ☐ Aquatic bed
- 2 Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other_________________

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

0

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

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

-3

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

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

2

- 1 Vegetated hummucks/tussucks
- 0 Coarse woody debris >15cm (6in)
- 0 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	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

Category 1

23

End of Quantitative Rating. Complete Categorization Worksheets.

WETLAND 12

ORAM v. 5.0 Field Form Quantitative Rating

W-pr 6/7/12-3

Site:	Rater(s):	Date:

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.
- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0 ☐ 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)

3	3
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- 0 ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

10	13
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- 1 ☒ Precipitation (1)
- ☐ 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)
- 0 ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 (27.6in) (3)
- 1 ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- 1 ☐ 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)
- 7 ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☒ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☐ road bed/RR track
- ☒ dredging
- ☐ other ________

7	20
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- 3 ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- 1 ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- 3 ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☒ mowing
- ☐ grazing
- ☒ clearcutting
- ☐ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☒ sedimentation
- ☒ dredging
- ☐ farming
- ☐ nutrient enrichment

20
subtotal this page

last revised 1 February 2001 jjm

WETLAND 12

ORAM v. 5.0 Field Form Quantitative Rating

w-pr 6/7/12-3

Site: AEP Big Sandy	**Rater(s):** MDT, BAO	**Date:** 06/07/12

20
subtotal first page

max 10 pts.	subtotal
0	20

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)
- 0 ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

max 20 pts.	subtotal
2	22

Metric 6. Plant communities, interspersion, microtopography.

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

- ☐ Aquatic bed
- 2 Emergent
- ☐ Shrub
- ☐ Forest
- 2 ☐ Mudflats
- ☐ Open water
- ☐ Other________________

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

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

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

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

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

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

22

Category 1

End of Quantitative Rating. Complete Categorization Worksheets.

WETLAND 13

ORAM v. 5.0 Field Form Quantitative Rating

w-pr 6/7/12-4

Site: AEP BIG SANDY | **Rater(s):** WDT, BAO | **Date:** 06/07/12

Metric 1. Wetland Area (size).

max 6 pts. 0 | subtotal 0

Select one size class and assign score.
- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0 ☐ 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 <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

max 14 pts. 3 | subtotal 3

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)
- 0 ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

Metric 3. Hydrology.

max 30 pts. 15 | subtotal 18

3a. Sources of Water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- 4 ☒ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 (27.6in) (3)
- 1 ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3b. Connectivity. Score all that apply.
- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- 0 ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- 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)
- 7 ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☒ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☒ stormwater input
- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☐ other________________

Metric 4. Habitat Alteration and Development.

max 20 pts. 7 | subtotal 25

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- 3 ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- 1 ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- 3 ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☒ clearcutting
- ☐ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☒ sedimentation
- ☒ dredging
- ☐ farming
- ☐ nutrient enrichment

25

subtotal this page

last revised 1 February 2001 jjm

WETLAND 13

ORAM v. 5.0 Field Form Quantitative Rating

wpr 6/7/12-4

Site:	Rater(s):	Date:

25
subtotal first page

0	25
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

4	29
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

- ☐ Aquatic bed
- 2 Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other________________

2

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

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

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

0

Narrative Description of Vegetation Quality

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

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

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

-1

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

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

- 1 Vegetated hummucks/tussucks
- 0 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 2 Amphibian breeding pools

3

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

29

Category 1

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 14 W-MDT101510-01

Site: AEP BIG SANDY | **Rater(s):** B. OTTO, M. THOMAYER | **Date:** 10/15/10

max 6 pts.	subtotal
1	1

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

max 14 pts.	subtotal
7	8

Metric 2. Upland buffers and surrounding land use.

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

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

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

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

max 30 pts.	subtotal
17	25

Metric 3. Hydrology.

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

☐ High pH groundwater (5)
☐ Other groundwater (3)
4 ☒ Precipitation (1)
☒ 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)
1 ☒ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

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

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

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

☒ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3)
☐ Seasonally inundated (2)
☐ 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)
7 ☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☒ other DAM OUTFALL

max 20 pts.	subtotal
13	38

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

☐ mowing
☐ grazing
☒ clearcutting
☒ selective cutting
☐ woody debris removal
☐ toxic pollutants
☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☐ dredging —
☐ farming
☐ nutrient enrichment

38

subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 14 W-MDT101512-01

Site: AEP BIG SANDY	**Rater(s):** B. OTTO, M. THOMAYER	**Date:** 10/15/12

38
subtotal this page

0 | 38
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 1 Qualitative Rating (-10)

9 | 47
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

6
- ☐ Aquatic bed
- 3 Emergent
- 2 Shrub
- 1 Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other_________________

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

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

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

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

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

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

CAT. 2

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

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 15 W-MPT-101512-02

Site: AEP BIG SANDY **Rater(s):** B. OTTO, M. THOMPSON **Date:** 10/15/12

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

4	4
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

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

10	14
max 30 pts.	subtotal

Metric 3. Hydrology.

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

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

3b. Connectivity. Score all that apply.

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

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

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

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

- 4 ☒ Semi- to permanently inundated/saturated (4)
- ☐ 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)
- ☐ Recovered (7)
- 3 ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☒ other Dam OUTFALL

10.5	24.5
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

24.5

subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating WETLAND15 W-MDT101512-02

Site: AEP BIG SANDY **Rater(s):** B. OTTO, M. THOMAYER **Date:** 10/15/12

24.5
subtotal this page

0 | 24.5
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 1 Qualitative Rating (-10)

-3 | 21.5
max 20 pts. subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

1

- ☐ Aquatic bed
- 1 Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other________________

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

0

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

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

-5

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

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

1

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

CAT. 1

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

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

WETLAND 16

ORAM v. 5.0 Field Form Quantitative Rating

W-MDT101512-03

Site: AEP BIG SANDY	Rater(s): B. OTTO, M. THOMAYER	Date: 10/15/12

0 (max 6 pts.) | 0 (subtotal)

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

7 (max 14 pts.) | 7 (subtotal)

Metric 2. Upland buffers and surrounding land use.

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

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

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

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

11 (max 30 pts.) | 18 (subtotal)

Metric 3. Hydrology.

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

☐ High pH groundwater (5)
☐ Other groundwater (3)
1 ☒ Precipitation (1)
☐ 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)
1 ☒ Part of wetland/upland (e.g. forest), complex (1)
☐ Part of riparian or upland corridor (1)

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

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

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

☐ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3)
1 ☐ 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)
7 ☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☐ other

10.5 (max 20 pts.) | 28.5 (subtotal)

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

☐ mowing
☐ grazing
☒ clearcutting
☒ selective cutting
☐ woody debris removal
☐ toxic pollutants
☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☐ dredging
☐ farming
☐ nutrient enrichment

28.5 subtotal this page

last revised 1 February 2001 jjm

WETLAND 6

ORAM v. 5.0 Field Form Quantitative Rating

W-MDT-101512-03

Site: AEP Bk SANDY | **Rater(s):** B. OTTO, M. THOMAYER | **Date:** 10/15/12

28.5
subtotal first page

0 | 28.5
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 Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

4 | 32.5
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

4
- ☐ Aquatic bed
- 2 Emergent
- 2 Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other________________

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

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

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

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

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

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

CAT. 2

32.5

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM v. 5.0 Field Form Quantitative Rating WETLAND 17

W-MOT-101512-04

Site: AEP BIG SANDY	**Rater(s):** B. OTTO, M. THOMAYER	**Date:** 10/15/12

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

7	9
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

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

14	23
max 30 pts.	subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- 4 ☒ Precipitation (1)
- ☒ 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)
- 1 ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☒ Part of riparian or upland corridor (1)

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

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

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

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- 1 ☐ 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)
- 7 ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☒ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☐ other_________________

13	36
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

36
subtotal this page

last revised 1 February 2001 jjm

WETLAND 17

ORAM v. 5.0 Field Form Quantitative Rating

W-MDT101512-04

Site: AEP Big Sandy | **Rater(s):** BAO, MDT | **Date:** 10/15/12

36
subtotal first page

0 | 36
max 10 pts. | subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

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

10 | 46
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

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

6

☐ Aquatic bed
3 Emergent
1 Shrub
2 Forest
☐ Mudflats
☐ Open water
☐ Other_______________

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

3

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

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

1

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

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

0

0 Vegetated hummucks/tussucks
0 Coarse woody debris >15cm (6in)
0 Standing dead >25cm (10in) dbh
0 Amphibian breeding pools

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

CAT 2

46

End of Quantitative Rating. Complete Categorization Worksheets.

APPENDIX C

USACE FUNCTIONAL ASSESSEMENT FOR HIGH-GRADIENT EPHEMERAL AND INTERMITTENT STREAM FORMS

Representative Field Sheet for Habitat Area 1

Version 1-25-11

High-Gradient Headwater Streams in eastern Kentucky and western West Virginia
Field Data Sheet and Calculator

Team: M. Thomayer, B. Otto
Project Name: Big Sandy Pond Closure Project
Location: Lawrence County, Kentucky (Stream Habitat Area 1)
Latitude/UTM Northing: 38.179562
Longitude/UTM Easting: -82.624478
Sampling Date: 15 October 2012
SAR Number:
Reach Length (ft): 185
Stream Type: Ephemeral Stream ▼

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site ▼ Before Project ▼

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

95.5 %

List the percent cover measurements at each point below:

100	90	90	100	95	100	100	95	90	95

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.5

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	**Rating Description**
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

2	3	2	1	2	3	2	1	2	2
2	3	2	4	2	3	2	3	2	1
2	3	3	2	4	3	4	3	4	4

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.08 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.08	0.08	0.08	0.08	0.08	0.50	0.08	0.08	0.08	0.08
0.08	0.10	0.08	1.00	0.08	0.50	0.08	0.50	0.08	0.08
0.08	0.25	0.25	0.50	4.00	2.00	5.00	4.00	10.00	11.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

16 %

Left Bank: 15 ft
Right Bank: 15 ft

Representative Field Sheet for Habitat Area 1

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. 3.2

Number of downed woody stems: 6

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. 10.2

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
8	10	6	12	8	9	12	9	8	6
14	5	9	11	12	7	16	6	10	11
12	16	11	10		13	15			

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. 0.5

Left Side: 1 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. Not Used

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. 2.70

Group 1 = 1.0

- ☑ *Acer rubrum*
- ☐ *Acer saccharum*
- ☐ *Aesculus flava*
- ☐ *Asimina triloba*
- ☐ *Betula alleghaniensis*
- ☐ *Betula lenta*
- ☐ *Carya alba*
- ☐ *Carya glabra*
- ☐ *Carya ovalis*
- ☑ *Carya ovata*
- ☑ *Cornus florida*
- ☐ *Fagus grandifolia*
- ☐ *Fraxinus americana*
- ☐ *Liriodendron tulipifera*
- ☐ *Magnolia acuminata*
- ☐ *Magnolia tripetala*
- ☐ *Nyssa sylvatica*
- ☐ *Oxydendrum arboreum*
- ☑ *Prunus serotina*
- ☑ *Quercus alba*
- ☐ *Quercus coccinea*
- ☐ *Quercus imbricaria*
- ☐ *Quercus prinus*
- ☐ *Quercus rubra*
- ☐ *Quercus velutina*
- ☐ *Sassafras albidum*
- ☐ *Tilia americana*
- ☐ *Tsuga canadensis*
- ☐ *Ulmus americana*

Group 2 (-1.0)

- ☐ *Ailanthus altissima*
- ☐ *Albizia julibrissin*
- ☐ *Alliaria petiolata*
- ☐ *Alternanthera philoxeroides*
- ☐ *Aster tataricus*
- ☐ *Cerastium fontanum*
- ☐ *Coronilla varia*
- ☐ *Elaeagnus umbellata*
- ☐ *Lespedeza bicolor*
- ☐ *Lespedeza cuneata*
- ☐ *Ligustrum obtusifolium*
- ☐ *Ligustrum sinense*
- ☐ *Lonicera japonica*
- ☐ *Lonicera tatarica*
- ☐ *Lotus corniculatus*
- ☐ *Lythrum salicaria*
- ☐ *Microstegium vimineum*
- ☐ *Paulownia tomentosa*
- ☐ *Polygonum cuspidatum*
- ☐ *Pueraria montana*
- ☐ *Rosa multiflora*
- ☐ *Sorghum halepense*
- ☐ *Verbena brasiliensis*

5 Species in Group 1

0 Species in Group 2

Representative Field Sheet for Habitat Area 1

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

91.88 %

Left Side				Right Side			
80	100	95	85	100	95	90	85
100	100	90	95	100	100	75	80

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

1.00

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (>75% ground cover) ▼	1	100	100
▼			
▼			
▼			
▼			
▼			
▼			
▼			

Summary			Notes:
Variable	Value	VSI	
$V_{CCANOPY}$	96 %	1.00	
V_{EMBED}	2.5	0.65	
$V_{SUBSTRATE}$	0.08 in	0.04	
V_{BERO}	16 %	0.99	
V_{LWD}	3.2	0.41	
V_{TDBH}	10.2	1.00	
V_{SNAG}	0.5	0.91	
V_{SSD}	Not Used	Not Used	
V_{SRICH}	2.70	1.00	
$V_{DETRITUS}$	91.9 %	1.00	
V_{HERB}	Not Used	Not Used	

V_{WLUSE}	1	1.00	

Representative Field Sheet for Habitat Area 2

Version 1-25-11

High-Gradient Headwater Streams in eastern Kentucky and western West Virginia
Field Data Sheet and Calculator

Team: M. Thomayer, P. Renner

Project Name: Big Sandy Pond Closure Project

Location: Lawrence County, Kentucky (Stream Habitat Area 2)

Latitude/UTM Northing: 38.182254

Longitude/UTM Easting: -82.62765

Sampling Date: 5 June 2012

SAR Number:

Reach Length (ft): 88

Stream Type: Ephemeral Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

87.0 %

List the percent cover measurements at each point below:

100	100	100	100	95	100	100	95	65	15

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

1.9

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

1	2	1	2	3	2	2	2	1	2
2	3	1	2	1	2	2	2	1	2
2	2	3	1	1	2	3	3	2	3

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.08 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.08	0.08	0.08	1.00	0.08	0.20	0.08	0.50	0.08	0.08
0.08	0.40	0.50	1.50	0.08	0.08	0.08	0.08	0.08	0.10
0.25	0.50	0.08	1.00	0.08	4.00	0.50	2.00	1.00	0.08

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

8 %

Left Bank: 2 ft

Right Bank: 5 ft

Representative Field Sheet for Habitat Area 2

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **3.4**

Number of downed woody stems: 3

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **10.7**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
10	11	8	12	9	15	12	9	13	11
12	6	4	19	6	14	9	8	7	12
11	7	13	14	21	18	13	9	7	11
7	5	10							

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **2.3**

Left Side: 1 Right Side: 1

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **6.82**

Group 1 = 1.0

- ☑ *Acer rubrum*
- ☐ *Acer saccharum*
- ☐ *Aesculus flava*
- ☐ *Asimina triloba*
- ☐ *Betula alleghaniensis*
- ☐ *Betula lenta*
- ☐ *Carya alba*
- ☐ *Carya glabra*
- ☐ *Carya ovalis*
- ☑ *Carya ovata*
- ☐ *Cornus florida*
- ☑ *Fagus grandifolia*
- ☐ *Fraxinus americana*
- ☐ *Liriodendron tulipifera*
- ☐ *Magnolia acuminata*
- ☐ *Magnolia tripetala*
- ☐ *Nyssa sylvatica*
- ☐ *Oxydendrum arboreum*
- ☑ *Prunus serotina*
- ☑ *Quercus alba*
- ☐ *Quercus coccinea*
- ☐ *Quercus imbricaria*
- ☐ *Quercus prinus*
- ☑ *Quercus rubra*
- ☐ *Quercus velutina*
- ☐ *Sassafras albidum*
- ☐ *Tilia americana*
- ☐ *Tsuga canadensis*
- ☐ *Ulmus americana*

6 Species in Group 1

Group 2 (-1.0)

- ☐ *Ailanthus altissima*
- ☐ *Albizia julibrissin*
- ☐ *Alliaria petiolata*
- ☐ *Alternanthera philoxeroides*
- ☐ *Aster tataricus*
- ☐ *Cerastium fontanum*
- ☐ *Coronilla varia*
- ☐ *Elaeagnus umbellata*
- ☐ *Lespedeza bicolor*
- ☐ *Lespedeza cuneata*
- ☐ *Ligustrum obtusifolium*
- ☐ *Ligustrum sinense*
- ☐ *Lonicera japonica*
- ☐ *Lonicera tatarica*
- ☐ *Lotus corniculatus*
- ☐ *Lythrum salicaria*
- ☐ *Microstegium vimineum*
- ☐ *Paulownia tomentosa*
- ☐ *Polygonum cuspidatum*
- ☐ *Pueraria montana*
- ☐ *Rosa multiflora*
- ☐ *Sorghum halepense*
- ☐ *Verbena brasiliensis*

0 Species in Group 2

Representative Field Sheet for Habitat Area 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

84.38 %

Left Side				Right Side			
100	80	75	100	100	95	90	100
50	75	100	65	65	85	95	75

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

1.00

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (>75% ground cover) ▼	1	100	100
▼			
▼			
▼			
▼			
▼			
▼			
▼			

Summary

Variable	Value	VSI
$V_{CCANOPY}$	87 %	0.99
V_{EMBED}	1.9	0.44
$V_{SUBSTRATE}$	0.08 in	0.04
V_{BERO}	8 %	1.00
V_{LWD}	3.4	0.43
V_{TDBH}	10.7	1.00
V_{SNAG}	2.3	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	6.82	1.00
$V_{DETRITUS}$	84.4 %	1.00
V_{HERB}	Not Used	Not Used

Notes:

Lower reaches of streams have been removed as a result of historical work around existing pond.

Representative Field Sheet for Habitat Area 2

V_{WLUSE}	1	1.00	

Representative Field Sheet for Habitat Area 3

Version 1-25-11

High-Gradient Headwater Streams in eastern Kentucky and western West Virginia
Field Data Sheet and Calculator

Team: M. Thomayer, B. Otto
Project Name: Big Sandy Pond Closure Project
Location: Lawrence County, Kentucky (Stream Habitat Area 3)
Latitude/UTM Northing: 38.183078
Longitude/UTM Easting: -82.637348
Sampling Date: 24 May 2012
SAR Number:
Reach Length (ft): 200
Stream Type: Ephemeral Stream ▼
Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)
Site and Timing: Project Site ▼ Before Project ▼

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

84.5 %

List the percent cover measurements at each point below:

100	95	85	100	95	100	100	85	65	20

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

1.8

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

1	2	1	2	1	2	2	2	1	2
2	3	1	2	1	2	2	2	1	2
2	2	3	1	1	2	3	3	2	2

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.08 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.08	0.08	0.08	0.50	0.08	0.20	0.08	0.50	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.10
0.25	0.50	0.08	1.00	0.08	2.00	0.50	2.00	1.00	0.08

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

14 %

Left Bank: 12 ft
Right Bank: 15 ft

Representative Field Sheet for Habitat Area 3

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. 2.0

Number of downed woody stems: 4

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. 8.5

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
10	11	8	12	9	9	12	9	13	11
12	6	4	5	6	5	9	8	7	6
9	7	13	8	6	5	6	9	7	11
7	5				10	13			

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. 0.0

Left Side: 0 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. Not Used

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. 2.85

Group 1 = 1.0

☑ *Acer rubrum*
☐ *Acer saccharum*
☐ *Aesculus flava*
☐ *Asimina triloba*
☐ *Betula alleghaniensis*
☐ *Betula lenta*
☐ *Carya alba*
☐ *Carya glabra*
☐ *Carya ovalis*
☑ *Carya ovata*
☐ *Cornus florida*
☑ *Fagus grandifolia*
☐ *Fraxinus americana*
☑ *Liriodendron tulipifera*
☐ *Magnolia acuminata*
☐ *Magnolia tripetala*
☐ *Nyssa sylvatica*
☐ *Oxydendrum arboreum*
☑ *Prunus serotina*
☑ *Quercus alba*
☐ *Quercus coccinea*
☐ *Quercus imbricaria*
☐ *Quercus prinus*
☑ *Quercus rubra*
☐ *Quercus velutina*
☐ *Sassafras albidum*
☐ *Tilia americana*
☐ *Tsuga canadensis*
☐ *Ulmus americana*

Group 2 (-1.0)

☐ *Ailanthus altissima*
☐ *Albizia julibrissin*
☐ *Alliaria petiolata*
☐ *Alternanthera philoxeroides*
☐ *Aster tataricus*
☐ *Cerastium fontanum*
☐ *Coronilla varia*
☐ *Elaeagnus umbellata*
☐ *Lespedeza bicolor*
☐ *Lespedeza cuneata*
☐ *Ligustrum obtusifolium*
☐ *Ligustrum sinense*
☐ *Lonicera japonica*
☐ *Lonicera tatarica*
☐ *Lotus corniculatus*
☐ *Lythrum salicaria*
☐ *Microstegium vimineum*
☐ *Paulownia tomentosa*
☐ *Polygonum cuspidatum*
☐ *Pueraria montana*
☑ *Rosa multiflora*
☐ *Sorghum halepense*
☐ *Verbena brasiliensis*

7 Species in Group 1

1 Species in Group 2

Representative Field Sheet for Habitat Area 3

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

88.44 %

Left Side				Right Side			
100	100	85	90	100	95	100	70
100	75	80	65	100	85	95	75

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.60

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (>75% ground cover) ▼	1	35	35
Forest and native range (50% to 75% ground cover) ▼	0.7	35	70
Newly graded areas (bare soil, no vegetation or pavement) ▼	0	30	100
▼			
▼			
▼			
▼			
▼			

Summary

Variable	Value	VSI
$V_{CCANOPY}$	85 %	0.95
V_{EMBED}	1.8	0.40
$V_{SUBSTRATE}$	0.08 in	0.04
V_{BERO}	14 %	1.00
V_{LWD}	2.0	0.25
V_{TDBH}	8.5	0.96
V_{SNAG}	0.0	0.10
V_{SSD}	Not Used	Not Used
V_{SRICH}	2.85	1.00
$V_{DETRITUS}$	88.4 %	1.00
V_{HERB}	Not Used	Not Used

Notes:

Landuse above stream channels has been altered in past. Appears the area was once used for borrow.

Representative Field Sheet for Habitat Area 3

V_{WLUSE}	0.6	0.63	

Representative Field Sheet for Habitat Area 4

Version 1-25-11

High-Gradient Headwater Streams in eastern Kentucky and western West Virginia
Field Data Sheet and Calculator

Team: M. Thomayer, B. Otto
Project Name: Big Sandy Pond Closure Project
Location: Lawrence County, Kentucky (Stream Habitat 4)
Latitude/UTM Northing: 38.184279
Longitude/UTM Easting: -82.644254
Sampling Date: 3 May 2012
SAR Number:
Reach Length (ft): 220
Stream Type: Ephemeral Stream ▼

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site ▼ Before Project ▼

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

99.0 %

List the percent cover measurements at each point below:

100	100	95	100	100	100	100	100	100	95

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.5

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

2	3	2	1	2	3	2	1	2	2
2	3	2	3	2	3	2	3	2	1
2	3	3	2	4	3	4	3	4	4

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.08 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.08	0.08	0.08	0.08	0.08	1.00	0.08	0.08	0.08	0.08
0.08	0.10	0.08	1.00	0.08	0.50	0.08	0.50	0.08	0.08
0.08	1.00	0.25	1.00	4.00	2.00	5.00	4.00	6.00	10.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

14 %

Left Bank: 17 ft
Right Bank: 14 ft

Representative Field Sheet for Habitat Area 4

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **2.7**

Number of downed woody stems: 6

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **11.6**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
8	10	12	12	17	9	12	9	13	6
14	5	9	11	12	7	16	11	10	14
12	16	11	10	14	13	15	10	18	
13									

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **2.3**

Left Side: 3 Right Side: 2

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **2.73**

Group 1 = 1.0

- ☑ *Acer rubrum*
- ☐ *Acer saccharum*
- ☐ *Aesculus flava*
- ☐ *Asimina triloba*
- ☐ *Betula alleghaniensis*
- ☐ *Betula lenta*
- ☐ *Carya alba*
- ☐ *Carya glabra*
- ☐ *Carya ovalis*
- ☑ *Carya ovata*
- ☑ *Cornus florida*
- ☐ *Fagus grandifolia*
- ☐ *Fraxinus americana*
- ☐ *Liriodendron tulipifera*
- ☐ *Magnolia acuminata*
- ☐ *Magnolia tripetala*
- ☐ *Nyssa sylvatica*
- ☐ *Oxydendrum arboreum*
- ☑ *Prunus serotina*
- ☑ *Quercus alba*
- ☐ *Quercus coccinea*
- ☐ *Quercus imbricaria*
- ☐ *Quercus prinus*
- ☑ *Quercus rubra*
- ☐ *Quercus velutina*
- ☐ *Sassafras albidum*
- ☐ *Tilia americana*
- ☐ *Tsuga canadensis*
- ☐ *Ulmus americana*

Group 2 (-1.0)

- ☐ *Ailanthus altissima*
- ☐ *Albizia julibrissin*
- ☐ *Alliaria petiolata*
- ☐ *Alternanthera philoxeroides*
- ☐ *Aster tataricus*
- ☐ *Cerastium fontanum*
- ☐ *Coronilla varia*
- ☐ *Elaeagnus umbellata*
- ☐ *Lespedeza bicolor*
- ☐ *Lespedeza cuneata*
- ☐ *Ligustrum obtusifolium*
- ☐ *Ligustrum sinense*
- ☐ *Lonicera japonica*
- ☐ *Lonicera tatarica*
- ☐ *Lotus corniculatus*
- ☐ *Lythrum salicaria*
- ☐ *Microstegium vimineum*
- ☐ *Paulownia tomentosa*
- ☐ *Polygonum cuspidatum*
- ☐ *Pueraria montana*
- ☐ *Rosa multiflora*
- ☐ *Sorghum halepense*
- ☐ *Verbena brasiliensis*

6 Species in Group 1

0 Species in Group 2

Representative Field Sheet for Habitat Area 4

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot. **93.75 %**

Left Side				Right Side			
95	100	65	100	100	95	90	100
100	100	90	95	100	100	75	95

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot. **Not Used**

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed: **1.00**

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (>75% ground cover)	1	100	100

Summary		
Variable	Value	VSI
$V_{CCANOPY}$	99 %	1.00
V_{EMBED}	2.5	0.64
$V_{SUBSTRATE}$	0.08 in	0.04
V_{BERO}	14 %	1.00
V_{LWD}	2.7	0.34
V_{TDBH}	11.6	1.00
V_{SNAG}	2.3	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	2.73	1.00
$V_{DETRITUS}$	93.8 %	1.00
V_{HERB}	Not Used	Not Used

Notes:

Streams are within mature upland forest.

V_{WLUSE}	1	1.00	

Representative Field Sheet for Habitat Area 5

Version 1-25-11

High-Gradient Headwater Streams in eastern Kentucky and western West Virginia
Field Data Sheet and Calculator

Team: M. Thomayer, B. Otto

Project Name: Big Sandy Pond Closure Project

Location: Lawrence County, Kentucky (Stream Habitat Area 5)

Latitude/UTM Northing: 38.184011

Longitude/UTM Easting: -82.647594

Sampling Date: 15 May 2012

SAR Number:

Reach Length (ft): 310

Stream Type: Ephemeral Stream ▼

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site ▼ Before Project ▼

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

98.5 %

List the percent cover measurements at each point below:

100	95	100	100	95	100	100	95	100	100

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.0

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

1	2	1	2	1	2	2	2	1	2
2	3	1	2	1	2	2	2	1	2
2	2	3	1	1	2	3	4	3	4

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.08 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.08	0.08	0.08	0.50	0.08	0.20	0.08	0.50	0.08	0.08
0.08	0.50	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.10
0.25	0.50	1.00	1.00	0.08	2.00	2.00	6.00	8.00	5.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

6 %

Left Bank: 8 ft

Right Bank: 10 ft

Representative Field Sheet for Habitat Area 5

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **1.9**

Number of downed woody stems: 6

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **8.2**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
10	11	8	12	9	9	12	9	13	11
12	6	4	5	6	5	9	8	7	6
9	7	13	8	6	5	6	9	7	11
7	5	6	9	5	10	13	5	7	9
5	8	11			6	5	9	11	

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **0.6**

Left Side: 1 Right Side: 1

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **1.87**

Group 1 = 1.0

☑ *Acer rubrum*
☐ *Acer saccharum*
☐ *Aesculus flava*
☐ *Asimina triloba*
☐ *Betula alleghaniensis*
☐ *Betula lenta*
☐ *Carya alba*
☐ *Carya glabra*
☐ *Carya ovalis*
☑ *Carya ovata*
☐ *Cornus florida*
☑ *Fagus grandifolia*
☐ *Fraxinus americana*
☑ *Liriodendron tulipifera*
☐ *Magnolia acuminata*
☐ *Magnolia tripetala*
☐ *Nyssa sylvatica*
☐ *Oxydendrum arboreum*
☑ *Prunus serotina*
☑ *Quercus alba*
☐ *Quercus coccinea*
☐ *Quercus imbricaria*
☐ *Quercus prinus*
☑ *Quercus rubra*
☐ *Quercus velutina*
☐ *Sassafras albidum*
☐ *Tilia americana*
☐ *Tsuga canadensis*
☐ *Ulmus americana*

Group 2 (-1.0)

☐ *Ailanthus altissima*
☐ *Albizia julibrissin*
☐ *Alliaria petiolata*
☐ *Alternanthera philoxeroides*
☐ *Aster tataricus*
☐ *Cerastium fontanum*
☐ *Coronilla varia*
☐ *Elaeagnus umbellata*
☐ *Lespedeza bicolor*
☐ *Lespedeza cuneata*
☐ *Ligustrum obtusifolium*
☐ *Ligustrum sinense*
☐ *Lonicera japonica*
☐ *Lonicera tatarica*
☐ *Lotus corniculatus*
☐ *Lythrum salicaria*
☐ *Microstegium vimineum*
☐ *Paulownia tomentosa*
☐ *Polygonum cuspidatum*
☐ *Pueraria montana*
☑ *Rosa multiflora*
☐ *Sorghum halepense*
☐ *Verbena brasiliensis*

7 Species in Group 1

1 Species in Group 2

Representative Field Sheet for Habitat Area 5

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot. 89.06 %

Left Side				Right Side			
100	95	85	90	100	95	100	85
100	75	80	65	100	85	95	75

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot. Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed: 0.90

Land Use (Choose From Drop List)	Runoff Score	% in Catchment	Running Percent (not >100)
Forest and native range (>75% ground cover)	1	65	65
Forest and native range (50% to 75% ground cover)	0.7	35	100

Summary		
Variable	Value	VSI
$V_{CCANOPY}$	99 %	1.00
V_{EMBED}	2.0	0.45
$V_{SUBSTRATE}$	0.08 in	0.04
V_{BERO}	6 %	1.00
V_{LWD}	1.9	0.24
V_{TDBH}	8.2	0.90
V_{SNAG}	0.6	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	1.87	0.89
$V_{DETRITUS}$	89.1 %	1.00
V_{HERB}	Not Used	Not Used

Notes:

Forest is younger than other areas on property. Understory is denser than most other locations on property.

Representative Field Sheet for Habitat Area 5

V_{WLUSE}	0.9	0.95	

Representative Field Sheet for Habitat Area 6

Version 1-25-11

High-Gradient Headwater Streams in eastern Kentucky and western West Virginia
Field Data Sheet and Calculator

Team: M. Thomayer, B. Otto

Project Name: Big Sandy Pond Closure Project

Location: Lawrence County, Kentucky (Stream Habitat Area 6)

Latitude/UTM Northing: 38.177507

Longitude/UTM Easting: -82.639347

Sampling Date: 4 May 2012

SAR Number:

Reach Length (ft): 180

Stream Type: Ephemeral Stream ▼

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site ▼ Before Project ▼

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

95.5 %

List the percent cover measurements at each point below:

100	100	100	100	95	100	100	95	100	65

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

1.8

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

1	2	1	2	1	2	2	2	1	2
2	3	1	2	1	2	2	2	1	2
2	2	3	1	1	2	3	2	2	3

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.08 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.08	0.08	0.08	0.50	0.08	0.20	0.08	0.50	0.08	0.08
0.08	0.50	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.10
0.25	0.50	1.00	1.00	0.08	3.00	2.00	6.00	8.00	5.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

6 %

Left Bank: 4 ft

Right Bank: 6 ft

Representative Field Sheet for Habitat Area 6

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **3.9**

Number of downed woody stems: 7

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **9.1**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
10	11	8	12	9	9	12	9	13	11
12	6	4	5	6	5	14	8	15	6
9	13	15	8	6	5	6	13	7	11
12	11	12	9	5	10	13	5	7	9
					6	5	9	11	

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **1.1**

Left Side: 2 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **3.15**

Group 1 = 1.0

☑ *Acer rubrum*
☐ *Acer saccharum*
☐ *Aesculus flava*
☐ *Asimina triloba*
☐ *Betula alleghaniensis*
☐ *Betula lenta*
☐ *Carya alba*
☐ *Carya glabra*
☐ *Carya ovalis*
☑ *Carya ovata*
☐ *Cornus florida*
☑ *Fagus grandifolia*
☐ *Fraxinus americana*
☑ *Liriodendron tulipifera*
☐ *Magnolia acuminata*
☐ *Magnolia tripetala*
☐ *Nyssa sylvatica*
☐ *Oxydendrum arboreum*
☑ *Prunus serotina*
☑ *Quercus alba*
☐ *Quercus coccinea*
☐ *Quercus imbricaria*
☐ *Quercus prinus*
☑ *Quercus rubra*
☐ *Quercus velutina*
☐ *Sassafras albidum*
☐ *Tilia americana*
☐ *Tsuga canadensis*
☐ *Ulmus americana*

Group 2 (-1.0)

☐ *Ailanthus altissima*
☐ *Albizia julibrissin*
☐ *Alliaria petiolata*
☐ *Alternanthera philoxeroides*
☐ *Aster tataricus*
☐ *Cerastium fontanum*
☐ *Coronilla varia*
☐ *Elaeagnus umbellata*
☐ *Lespedeza bicolor*
☐ *Lespedeza cuneata*
☐ *Ligustrum obtusifolium*
☐ *Ligustrum sinense*
☐ *Lonicera japonica*
☐ *Lonicera tatarica*
☐ *Lotus corniculatus*
☐ *Lythrum salicaria*
☐ *Microstegium vimineum*
☐ *Paulownia tomentosa*
☐ *Polygonum cuspidatum*
☐ *Pueraria montana*
☑ *Rosa multiflora*
☐ *Sorghum halepense*
☐ *Verbena brasiliensis*

7 Species in Group 1

1 Species in Group 2

Representative Field Sheet for Habitat Area 6

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

90.00 %

Left Side				Right Side			
100	95	95	90	100	95	90	85
100	90	80	65	100	85	95	75

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.81

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (>75% ground cover) ▼	1	35	35
Forest and native range (50% to 75% ground cover) ▼	0.7	65	100
▼			
▼			
▼			
▼			
▼			
▼			

Summary

Variable	Value	VSI
$V_{CCANOPY}$	96 %	1.00
V_{EMBED}	1.8	0.40
$V_{SUBSTRATE}$	0.08 in	0.04
V_{BERO}	6 %	1.00
V_{LWD}	3.9	0.49
V_{TDBH}	9.1	1.00
V_{SNAG}	1.1	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	3.15	1.00
$V_{DETRITUS}$	90.0 %	1.00
V_{HERB}	Not Used	Not Used

Notes:

Forest is younger than other areas on property. Understory is very dense in some locations. Downstream limits of some channels have been impacted by current work on pond.

Representative Field Sheet for Habitat Area 6

V_{WLUSE}	0.81	0.85	

Representative Field Sheet for Habitat Area 7

Version 1-25-11

High-Gradient Headwater Streams in eastern Kentucky and western West Virginia
Field Data Sheet and Calculator

Team: M. Thomayer, P. Renner

Project Name: Big Sandy Pond Closure Project

Location: Lawrence County, Kentucky (Stream Habitat Area 7)

Latitude/UTM Northing: 38.17447

Longitude/UTM Easting: -82.648223

Sampling Date: 6 June 2012

SAR Number:

Reach Length (ft): 225

Stream Type: Ephemeral Stream ▼

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site ▼ Before Project ▼

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

99.5 %

List the percent cover measurements at each point below:

100	100	95	100	100	100	100	100	100	100

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.5

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

2	3	2	1	2	3	2	1	2	2
2	3	2	3	2	3	2	3	2	2
2	3	3	2	4	3	4	3	4	4

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.15 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.08	0.08	0.08	0.08	0.08	1.00	0.08	0.08	0.08	0.08
0.08	0.10	0.08	1.00	0.08	0.50	0.08	0.50	0.08	0.20
0.50	1.00	0.25	1.00	4.00	2.00	5.00	7.00	6.00	10.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

10 %

Left Bank: 11 ft

Right Bank: 12 ft

Representative Field Sheet for Habitat Area 7

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **3.1**

Number of downed woody stems: 7

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **12.0**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
8	10	12	12	17	9	12	15	13	6
14	5	9	11	12	7	16	11	10	14
12	16	11	10	14	13	15	10	18	12
13	12	15			9	13	15		

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **2.7**

Left Side: 3 Right Side: 3

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **2.67**

Group 1 = 1.0

- ☑ *Acer rubrum*
- ☐ *Acer saccharum*
- ☐ *Aesculus flava*
- ☐ *Asimina triloba*
- ☐ *Betula alleghaniensis*
- ☐ *Betula lenta*
- ☐ *Carya alba*
- ☐ *Carya glabra*
- ☐ *Carya ovalis*
- ☑ *Carya ovata*
- ☑ *Cornus florida*
- ☐ *Fagus grandifolia*
- ☐ *Fraxinus americana*
- ☐ *Liriodendron tulipifera*
- ☐ *Magnolia acuminata*
- ☐ *Magnolia tripetala*
- ☐ *Nyssa sylvatica*
- ☐ *Oxydendrum arboreum*
- ☑ *Prunus serotina*
- ☑ *Quercus alba*
- ☐ *Quercus coccinea*
- ☐ *Quercus imbricaria*
- ☐ *Quercus prinus*
- ☑ *Quercus rubra*
- ☐ *Quercus velutina*
- ☐ *Sassafras albidum*
- ☐ *Tilia americana*
- ☐ *Tsuga canadensis*
- ☐ *Ulmus americana*

6 Species in Group 1

Group 2 (-1.0)

- ☐ *Ailanthus altissima*
- ☐ *Albizia julibrissin*
- ☐ *Alliaria petiolata*
- ☐ *Alternanthera philoxeroides*
- ☐ *Aster tataricus*
- ☐ *Cerastium fontanum*
- ☐ *Coronilla varia*
- ☐ *Elaeagnus umbellata*
- ☐ *Lespedeza bicolor*
- ☐ *Lespedeza cuneata*
- ☐ *Ligustrum obtusifolium*
- ☐ *Ligustrum sinense*
- ☐ *Lonicera japonica*
- ☐ *Lonicera tatarica*
- ☐ *Lotus corniculatus*
- ☐ *Lythrum salicaria*
- ☐ *Microstegium vimineum*
- ☐ *Paulownia tomentosa*
- ☐ *Polygonum cuspidatum*
- ☐ *Pueraria montana*
- ☐ *Rosa multiflora*
- ☐ *Sorghum halepense*
- ☐ *Verbena brasiliensis*

0 Species in Group 2

Representative Field Sheet for Habitat Area 7

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 V$_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot. **96.88 %**

Left Side				Right Side			
95	100	100	100	100	100	90	100
100	100	90	95	100	100	85	95

11 V$_{HERB}$ Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot. **Not Used**

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V$_{WLUSE}$ Weighted Average of Runoff Score for watershed: **1.00**

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (>75% ground cover) ▼	1	100	100
▼			
▼			
▼			
▼			
▼			
▼			
▼			

Summary

Variable	Value	VSI
V$_{CCANOPY}$	100 %	1.00
V$_{EMBED}$	2.5	0.65
V$_{SUBSTRATE}$	0.15 in	0.08
V$_{BERO}$	10 %	1.00
V$_{LWD}$	3.1	0.39
V$_{TDBH}$	12.0	1.00
V$_{SNAG}$	2.7	1.00
V$_{SSD}$	Not Used	Not Used
V$_{SRICH}$	2.67	1.00
V$_{DETRITUS}$	96.9 %	1.00
V$_{HERB}$	Not Used	Not Used

Notes:

Streams are within mature upland forest.

V_{WLUSE}	1	1.00	

APPENDIX D

U.S. EPA RAPID BIOASSESSMENT STREAM FORMS

Stream 4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)

STREAM NAME S-BAO-101512-01	LOCATION AEP Big Sandy, Lawrence Co. KY
STATION # — RIVERMILE —	STREAM CLASS —
LAT 38.174875 LONG -82.625015	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS B. Otto, M. Thomeyer	

FORM COMPLETED BY B. Otto, M. Thomeyer URS Corp	DATE 10/15/12 TIME / / AM PM	REASON FOR SURVEY Pond Closure

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
____%•	%cloud cover	• ____%
•	clear/sunny	•

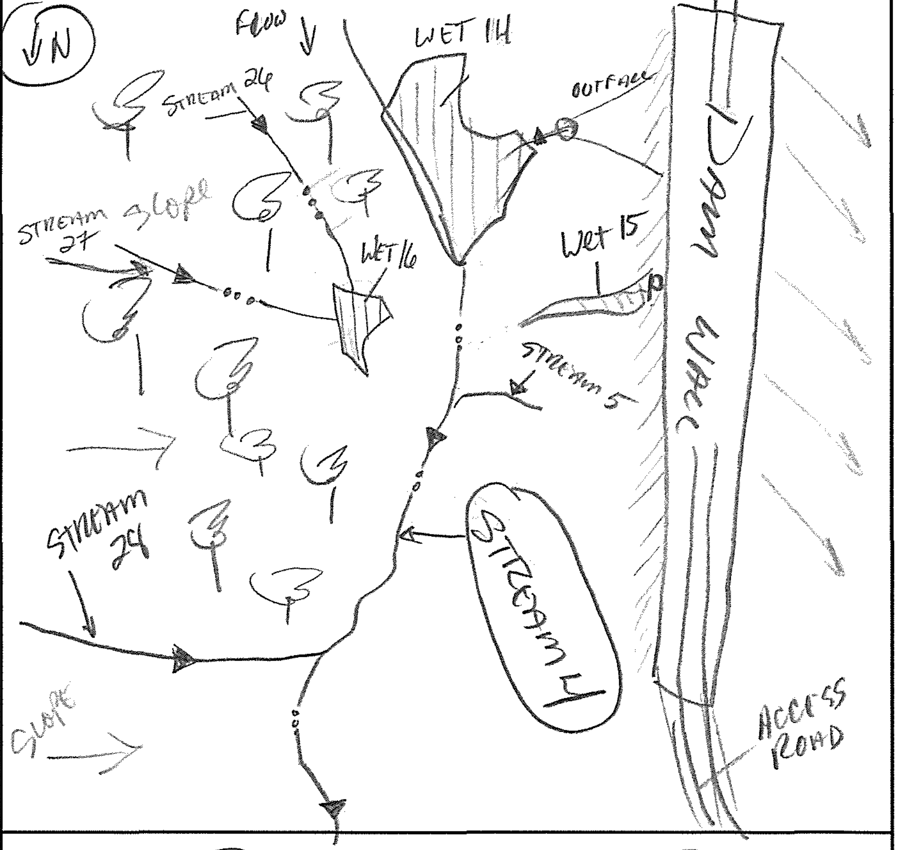
Has there been a heavy rain in the last 7 days?
• Yes • No

Air Temperature 80 °C

Other____________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
• Perennial [✓ • Intermittent] • Tidal

Stream Type
• Coldwater [✓ • Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- Other__________

Catchment Area__________km²

Stream 4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	**Predominant Surrounding Landuse** [✓ Forest] • Field/Pasture • Agricultural • Residential • Commercial • Industrial • Other ____ **Local Watershed NPS Pollution** • No evidence [✓ Some potential sources] • Obvious sources **Local Watershed Erosion** • None • Moderate [✓ Heavy]
RIPARIAN VEGETATION (18 meter buffer)	**Indicate the dominant type and record the dominant species present** [✓ Trees] • Shrubs • Grasses • Herbaceous **dominant species present** OAK-MAPLE MIXED
INSTREAM FEATURES	**Estimated Reach Length** ____m **Estimated Stream Width** 1ft. ~~m~~ **Sampling Reach Area** ____m² **Area in km² (m²x1000)** ____km² **Estimated Stream Depth** 8" ~~m~~ MPD IN. **Surface Velocity (at thalweg)** ____m/sec **Canopy Cover** • Partly open [✓ Partly shaded] • Shaded **High Water Mark** ____m **Proportion of Reach Represented by Stream Morphology Types** • Riffle____% • Run____% • Pool____% **Channelized** • Yes • No **Dam Present** • Yes • No
LARGE WOODY DEBRIS NONE	**LWD** ~~____m²~~ **Density of LWD** ____m²/km² **(LWD/ reach area)**
AQUATIC VEGETATION NONE	**Indicate the dominant type and record the dominant species present** • Rooted emergent • Rooted submergent • Rooted floating • Free floating • Floating Algae • Attached Algae **dominant species present** ____ **Portion of the reach with aquatic vegetation** ____%
WATER QUALITY AMD IMPACTED	**Temperature**____ °C **Specific Conductance**____ **Dissolved Oxygen** ____ **pH** ____ **Turbidity** ____ **WQ Instrument Used** ____ **Water Odors** • Normal/None • Sewage • Petroleum • Chemical • Fishy [✓ Other] AMD **Water Surface Oils** • Slick • Sheen • Globs • Flecks [✓ None] • Other____ **Turbidity (if not measured)** • Clear • Slightly turbid [✓ Turbid] • Opaque • Stained • Other____
SEDIMENT/ SUBSTRATE	**Odors** • Normal • Sewage • Petroleum • Chemical • Anaerobic • None • Other AMD **Oils** [✓ Absent] • Slight • Moderate • Profuse **Deposits** • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other____ **Looking at stones which are not deeply embedded, are the undersides black in color?** • Yes [✓ No]

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	20
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	40			
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	30			
Clay	< 0.004 mm (slick)				

Stream 4
S-BAD-D1512-01

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S-BAD-101512-01	LOCATION Big Sandy Pond Closure Site
STATION # — RIVERMILE —	STREAM CLASS —
LAT ______ LONG ______	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS BAD, MDT	
FORM COMPLETED BY BAD, MDT	DATE 10/15/12 TIME ______ AM [✓ PM]
	REASON FOR SURVEY Pond Closure

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE 13	20 19 18 17 16	15 14 [✓ 13] 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0

37

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 14	20 19 18 17 16	15 [✓ 14] 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 12	20 19 18 17 16	15 14 13 [✓ 12] 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0

64

Total Score 103

Stream 15
S-BAO-050312-04

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-BAO-050312-04	LOCATION AEP BIG SANDY, LAWRENCE CO. KY
STATION # — RIVERMILE —	STREAM CLASS —
LAT 38.185593 LONG -82.6048905	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS B. OTTO, M. THOMAYER	

FORM COMPLETED BY B. OTTO, M. THOMAYER, URS CORP	DATE 050312 TIME 0930 [✓ AM] PM	REASON FOR SURVEY POND CLOSURE

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
___%•	%cloud cover	• ___%
[✓ •]	[✓ clear/sunny]	•

~~Has there~~ Has there been a heavy rain in the last 7 days? [✓ Yes] • No

Air Temperature 90 °C

Other ______

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

STREAM CHARACTERIZATION

Stream Subsystem
• Perennial [✓ • Intermittent] • Tidal

Stream Type
• Coldwater [✓ • Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] SLOPE

Catchment Area_________km²

Stream B
S-BAO-050312-04

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
[✓ Forest] • Commercial
• Field/Pasture • Industrial
• Agricultural • Other ____________
• Residential

Local Watershed NPS Pollution
• No evidence [✓ Some potential sources]
• Obvious sources

Local Watershed Erosion
• None • Moderate [✓ Heavy]

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
[✓ Trees] • Shrubs • Grasses • Herbaceous
dominant species present MIXED MES - OAK-MAPLE-HICK - BEECH

INSTREAM FEATURES

Estimated Reach Length 815 ~~m~~ Ft.
Estimated Stream Width 2 ~~m~~ Ft.
Sampling Reach Area 815 ~~m²~~ Ft.
Area in km² (m²x1000) _______km²
Estimated Stream Depth 4 ~~m~~ IN. MPD
Surface Velocity (at thalweg) — m/sec

Canopy Cover
• Partly open • Partly shaded [✓ Shaded]
High Water Mark _______m
Proportion of Reach Represented by Stream Morphology Types
• Riffle 80 % • Run 0 %
• Pool 20 %
Channelized • Yes [✓ No]
Dam Present • Yes [✓ No]

LARGE WOODY DEBRIS

LWD _______m² THERE IS A LOT OF WOODY DEBRIS
Density of LWD _______m²/km² (LWD/ reach area)

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
• Rooted emergent • Rooted submergent • Rooted floating • Free floating
• Floating Algae • Attached Algae
dominant species present NONE
Portion of the reach with aquatic vegetation _____%

WATER QUALITY

Temperature ________ °C
Specific Conductance ________
Dissolved Oxygen ________
pH ________
Turbidity ________
WQ Instrument Used ______________

Water Odors
[✓ Normal/None] • Sewage
• Petroleum • Chemical
• Fishy • Other______________

Water Surface Oils
• Slick • Sheen • Globs • Flecks
• None • Other____________________

Turbidity (if not measured)
• Clear • Slightly turbid • Turbid
• Opaque • Stained • Other_______

SEDIMENT/ SUBSTRATE

Odors
[✓ Normal] • Sewage • Petroleum
• Chemical • Anaerobic • None
• Other______________________________

Oils
[✓ Absent] • Slight • Moderate • Profuse

Deposits
• Sludge • Sawdust • Paper fiber • Sand
• Relict shells • Other__________

Looking at stones which are not deeply embedded, are the undersides black in color?
• Yes [✓ No]

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	30			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	15			
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)	35			

Stream 13
S-BAO-050312-(

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME S-BAO-050312-04	LOCATION AEP Big Sandy, Lawrence Co. KY	
STATION # — RIVERMILE —	STREAM CLASS —	
LAT 38.185593 LONG -82.648905	RIVER BASIN —	
STORET # —	AGENCY —	
INVESTIGATORS B. Otto, M. Thomalyer, URS		
FORM COMPLETED BY B. Otto	DATE 050312 TIME 0930 [✓ AM] PM	REASON FOR SURVEY

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 [✓ 3] 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
26	**SCORE** 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 [✓ 3] 2 1 0

Stream 13
S-13AD-050312-01

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated broader than sampling reach	**6. Channel Alteration**	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
	SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
	SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
	SCORE 8 (RB)	Right Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
	SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0

20
10
6
16
18
70

Total Score 96

Stream 15
S-BAO-050412-02

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-BAO-050412-02	LOCATION AEP BIG SANDY, LAWRENCE CO. KY
STATION # — RIVERMILE —	STREAM CLASS —
LAT 38.174611 LONG -82.642901	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS B. OTTO, M. THOMAYER	
FORM COMPLETED BY B. OTTO	DATE 05/04/12 TIME 09:00 [✓ AM] PM
REASON FOR SURVEY POND CLOSURE	

WEATHER CONDITIONS

Now
- [✓ storm (heavy rain)]
- rain (steady rain)
- showers (intermittent)
- ____% %cloud cover
- clear/sunny

Past 24 hours
- storm (heavy rain)
- rain (steady rain)
- showers (intermittent)
- ____% %cloud cover
- [✓ clear/sunny]

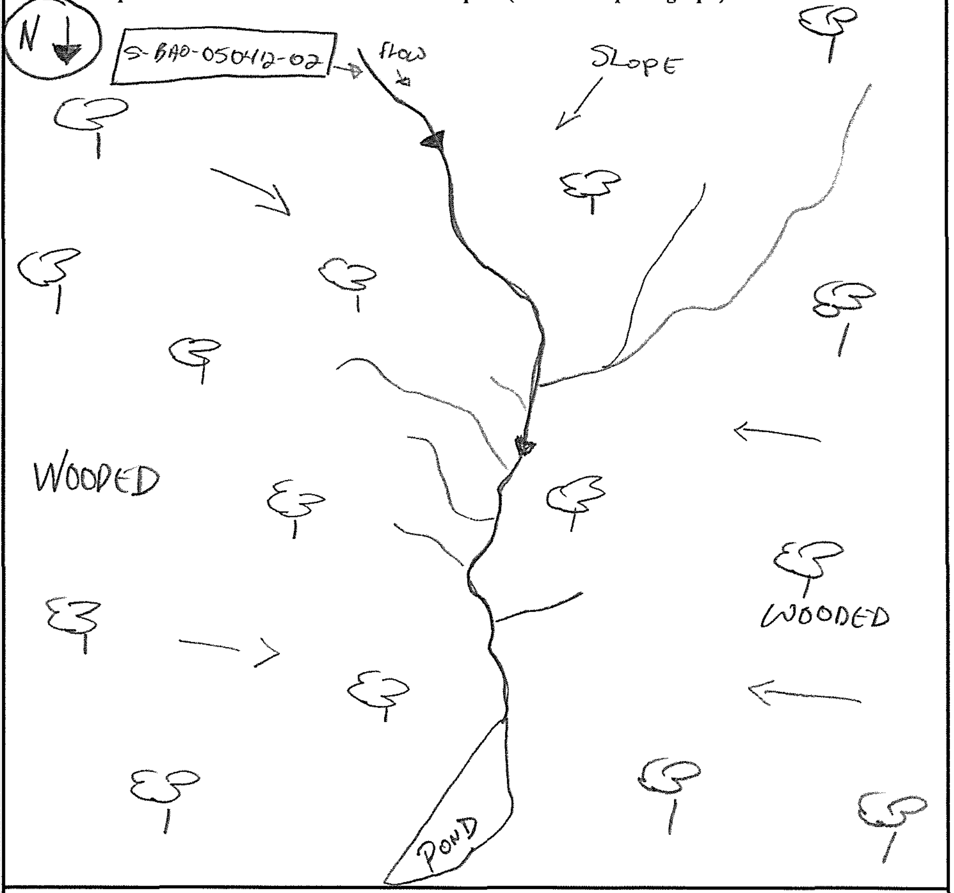
Has there been a heavy rain in the last 7 days?
[✓ Yes] No

Air Temperature 80 ° C

Other____________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
Perennial [✓ Intermittent] Tidal

Stream Type
Coldwater [✓ Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] SLOPE

Catchment Area_________km²

Stream 15
S-BAO-050412-02

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [✓ Forest]
- Field/Pasture
- Agricultural
- Residential
- Commercial
- Industrial
- Other ______

Local Watershed NPS Pollution
- No evidence
- [✓ Some potential sources]
- Obvious sources

Local Watershed Erosion
- None
- Moderate
- [✓ Heavy]

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- [✓ Trees]
- Shrubs
- Grasses
- Herbaceous

dominant species present MIXED MES- MAPLE, POPLAR, OAK, ect.

INSTREAM FEATURES

Estimated Reach Length 894 m

Estimated Stream Width 3 ~~m~~ FT.

Sampling Reach Area — m^2

Area in km^2 (m^2x1000) — km^2

Estimated Stream Depth 4 ~~m~~ IN. AVE.

Surface Velocity (at thalweg) ______ m/sec 6 IN MPD FAST AT TIME

Canopy Cover
- Partly open
- Partly shaded
- [✓ Shaded]

High Water Mark — m

Proportion of Reach Represented by Stream Morphology Types
- Riffle 60 %
- Run ______ %
- Pool 40 %

Channelized • Yes [✓ No]

Dam Present • Yes [✓ No]

LARGE WOODY DEBRIS

LWD ______ m^2

Density of LWD ______ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- Rooted emergent
- Rooted submergent
- Rooted floating
- Free floating
- Floating Algae
- Attached Algae

dominant species present NONE

Portion of the reach with aquatic vegetation ______%

WATER QUALITY

Temperature ______ °C

Specific Conductance ______

Dissolved Oxygen ______

pH ______

Turbidity ______

WQ Instrument Used ______

Water Odors
- [✓ Normal/None]
- Sewage
- Petroleum
- Chemical
- Fishy
- Other ______

Water Surface Oils
- Slick
- Sheen
- Globs
- Flecks
- None
- Other ______

Turbidity (if not measured)
- Clear
- Slightly turbid
- [✓ Turbid]
- Opaque
- Stained
- Other ______

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal]
- Sewage
- Petroleum
- Chemical
- Anaerobic
- None
- Other ______

Oils
- [✓ Absent]
- Slight
- Moderate
- Profuse

Deposits
- Sludge
- Sawdust
- Paper fiber
- Sand
- Relict shells
- Other ______

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes
- No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**
Bedrock		5
Boulder	> 256 mm (10")	15
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	20

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Characteristic**	**% Composition in Sampling Area**
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Stream 15
S-BAO-050412-02

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME S-BAO-050412-02	LOCATION AEP BIG SANDY, LAWRENCE, KY	
STATION # — RIVERMILE —	STREAM CLASS —	
LAT 38.185593 LONG -82.648905	RIVER BASIN —	
STORET #	AGENCY —	
INVESTIGATORS B. OTTO, M. THOMAYER		
FORM COMPLETED BY B. OTTO	DATE 050412 TIME 0900 [✓ AM] PM	REASON FOR SURVEY

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 15	20 19 18 17 16	[✓ 15] 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 13	20 19 18 17 16	15 14 [✓ 13] 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 11	20 19 18 17 16	15 14 13 12 [✓ 11]	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 15	20 19 18 17 16	[✓ 15] 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Stream 13
S-BAO-050412-C

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 15	20 19 18 17 16	[✓ 15] 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0

Total Score 144

Stream 10
S-BAO-051512-02

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-BAO-051512-02	LOCATION AEP BIG SANDY, LAWRENCE, KY
STATION # — RIVERMILE —	STREAM CLASS —
LAT 38.18225 LONG -82.048104	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS B. OTTO M. THOMAYER	

FORM COMPLETED BY B. OTTO, M. THOMAYER, URS	DATE 05/15/12 TIME 1440 AM [✓ PM]	REASON FOR SURVEY POND CLOSURE

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
___%•	%cloud cover	• ___%
•	[✓ clear/sunny]	•

Has there been a heavy rain in the last 7 days?
[✓ Yes] • No

Air Temperature 82 °C

Other ______________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

STREAM CHARACTERIZATION

Stream Subsystem
- Perennial
- [✓ Intermittent]
- Tidal

Stream Type
- Coldwater
- [✓ Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] SLOPE

Catchment Area ________km²

Stream 18
S-BAO-051512-02

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [✓ Forest]
- Field/Pasture
- Agricultural
- Residential
- Commercial
- Industrial
- Other ________

Local Watershed NPS Pollution
- No evidence
- [✓ Some potential sources]
- Obvious sources

Local Watershed Erosion
- None
- Moderate
- [✓ Heavy]

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- [✓ Trees]
- Shrubs
- Grasses
- Herbaceous

dominant species present SYCAMORE, TULIP POPULAR, BUCKEYE

INSTREAM FEATURES

Estimated Reach Length 1,120 ~~m~~ Ft

Estimated Stream Width 2.5 ~~m~~ Ft.

Sampling Reach Area — m²

Area in km² (m²x1000) — km²

Estimated Stream Depth 5 ~~m~~ IN MPD

Surface Velocity (at thalweg) — m/sec

Canopy Cover
- Partly open
- Partly shaded
- [✓ Shaded]

High Water Mark — m

Proportion of Reach Represented by Stream Morphology Types
- Riffle 50 %
- Run ____%
- Pool 50%

Channelized • Yes [✓ No]

Dam Present • Yes [✓ No]

LARGE WOODY DEBRIS

LWD ____ m²

Density of LWD ____ m²/km² (LWD/ reach area)

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- Rooted emergent
- Rooted submergent
- Rooted floating
- Free floating
- Floating Algae
- Attached Algae

dominant species present NONE

Portion of the reach with aquatic vegetation ____%

WATER QUALITY

Temperature ____ °C

Specific Conductance ____

Dissolved Oxygen ____

pH ____

Turbidity ____

WQ Instrument Used ____

Water Odors
- [✓ Normal/None]
- Sewage
- Petroleum
- Chemical
- Fishy
- Other ________

Water Surface Oils
- Slick
- Sheen
- Globs
- Flecks
- None
- Other ________

Turbidity (if not measured)
- Clear
- Slightly turbid
- [✓ Turbid]
- Opaque
- Stained
- Other ____

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal]
- Sewage
- Petroleum
- Chemical
- Anaerobic
- None
- Other ________

Oils
- [✓ Absent]
- Slight
- Moderate
- Profuse

Deposits
- Sludge
- Sawdust
- Paper fiber
- Sand
- Relict shells
- Other ________

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes
- No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		—
Boulder	> 256 mm (10")	20
Cobble	64-256 mm (2.5"-10")	10
Gravel	2-64 mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	30

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Stream 18
S-BAO-051512-02

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME S-BAO-051512-02	LOCATION AEP BIG SANDY, LAWRENCE, KY	
STATION # ______ RIVERMILE ______	STREAM CLASS —	
LAT ______ LONG —	RIVER BASIN —	
STORET # —	AGENCY —	
INVESTIGATORS B. OTTO, M. THOMAYER, URS		
FORM COMPLETED BY B. OTTO	DATE 051512 TIME ______ AM PM	REASON FOR SURVEY

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0

Stream 18
S-BAO-051512-02

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 7 (LB)	Left Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 7 (LB)	Left Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0

Total Score 112

Stream 24
S-BAO-052412-04

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-BAO-052412-04	LOCATION AEP BIG SANDY, LAWRENCE CO.KY	
STATION # — RIVERMILE —	STREAM CLASS —	
LAT 38.182538 LONG -82.636175	RIVER BASIN —	
STORET # —	AGENCY —	
INVESTIGATORS B. OTTO, M. THOMAYER, URS CORP		
FORM COMPLETED BY B. OTTO	DATE 05/24/12 TIME ________ AM PM	REASON FOR SURVEY POND CLOSURE

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
___%•	%cloud cover	• ___%
•	[✓ clear/sunny]	•

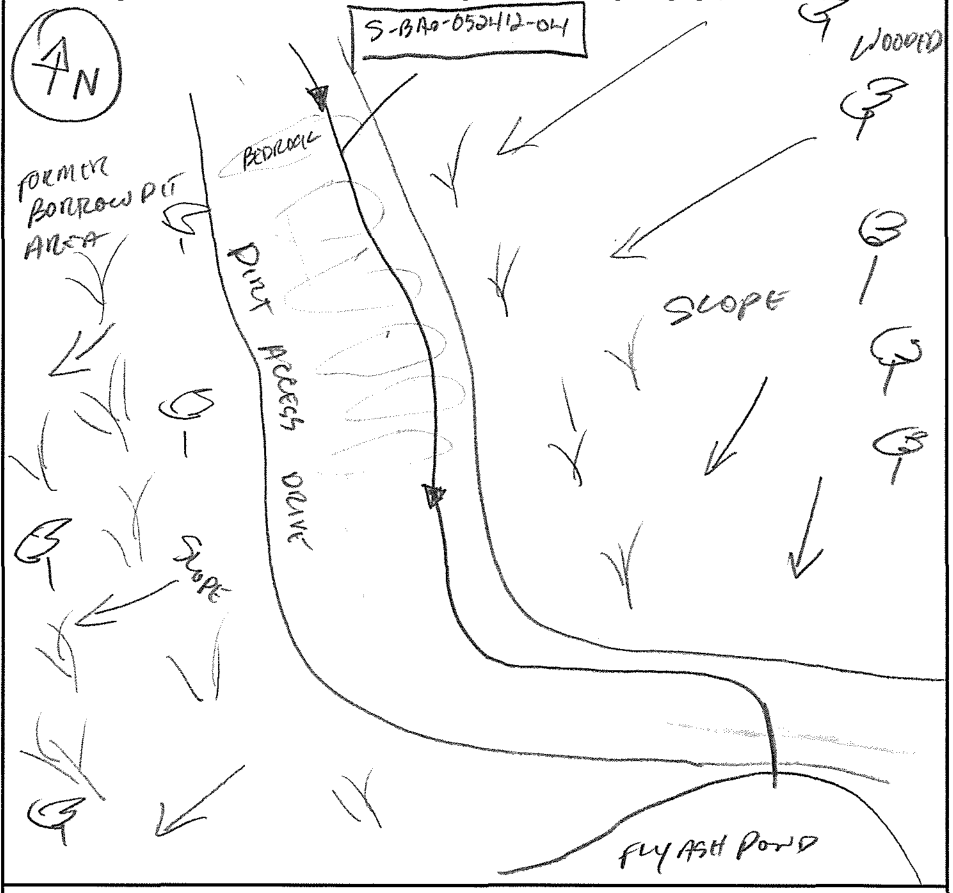
Has there been a heavy rain in the last 7 days?
• Yes [✓ • No]

Air Temperature 90 °C

Other ____________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem - EPHEMERAL
• Perennial • Intermittent • Tidal

Stream Type
• Coldwater • [✓ Warmwater]

Stream Origin
• Glacial
• Non-glacial montane
• Swamp and bog
• Spring-fed
• Mixture of origins
• [✓ Other] SLOPE

Catchment Area ________ km²

Stream 24
S-BAO-052412-04

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- Forest
- [✓ Field/Pasture]
- Agricultural
- Residential
- Commercial
- Industrial
- Other ______________

Local Watershed NPS Pollution
- No evidence
- [✓ Some potential sources]
- Obvious sources

Local Watershed Erosion
- None • Moderate • [✓ Heavy]

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- Trees • Shrubs • [✓ Grasses] • Herbaceous

dominant species present ________________________________

INSTREAM FEATURES

Estimated Reach Length 778 m

Estimated Stream Width 1 ~~m~~ ft.

Sampling Reach Area — m²

Area in km² (m²x1000) ______ km²

Estimated Stream Depth 0 ~~m~~ in.

Surface Velocity (at thalweg) — m/sec

Canopy Cover
- Partly [✓ open] • Partly shaded • Shaded

~~**High Water Mark**~~ ______ m

Proportion of Reach Represented by Stream Morphology Types
- Riffle ______% • ~~Run ______%~~
- ~~Pool ______%~~

NO flow

Channelized • Yes [✓ No]

Dam Present • Yes [✓ No]

~~**LARGE WOODY DEBRIS**~~

~~**LWD**~~ ______ m²

~~**Density of LWD**~~ ______ m²/km² (LWD/ reach area)

AQUATIC VEGETATION

NO flow

Indicate the dominant type and record the dominant species present
- Rooted emergent • Rooted submergent • Rooted floating • Free floating
- Floating Algae • Attached Algae

dominant species present ________________________________

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

NO flow

Temperature ______ °C

Specific Conductance ________

Dissolved Oxygen ________

pH ________

Turbidity ________

WQ Instrument Used ______________

Water Odors
- [✓ Normal/None] • Sewage
- Petroleum • Chemical
- Fishy • Other ______________

Water Surface Oils
- Slick • Sheen • Globs • Flecks
- None • Other ______________

Turbidity (if not measured)
- Clear • Slightly turbid • Turbid
- Opaque • Stained • Other ______

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal] • Sewage • Petroleum
- Chemical • Anaerobic • None
- Other ______________

Oils
- [✓ Absent] • Slight • Moderate • Profuse

Deposits
- Sludge • Sawdust • Paper fiber • Sand
- Relict shells • Other ______________

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes • No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**
Bedrock		50
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Characteristic**	**% Composition in Sampling Area**
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Stream 24
S-BAO 052412-04

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME S-BAO-052412-04	LOCATION AEP BIG SANDY, LAWRENCE CO., KY	
STATION #______ RIVERMILE______	STREAM CLASS —	
LAT 38.182538 LONG -82.636175	RIVER BASIN —	
STORET # —	AGENCY —	
INVESTIGATORS B. OTTO, M. THOMAYER		
FORM COMPLETED BY B. OTTO	DATE 05/24/12 TIME 11:05 [✓ AM] PM	REASON FOR SURVEY

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 11	20 19 18 17 16	15 14 13 12 [✓ 11]	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
28	**SCORE** 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

Stream 24
S-BAO-052412-04

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0

Total Score 67

landfill outfall 1
Stream 30

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME landfill outfall 1	LOCATION AEP Big Sandy
STATION #______ RIVERMILE______	STREAM CLASS —
LAT 38.188125 LONG -82.633499	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS MDT, PR	
FORM COMPLETED BY MDT, RAD	DATE 06/07/12 TIME 0800 [✓ AM] PM
	REASON FOR SURVEY POND CLOSURE

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
___%•	%cloud cover	• ___%
•	clear/sunny	•

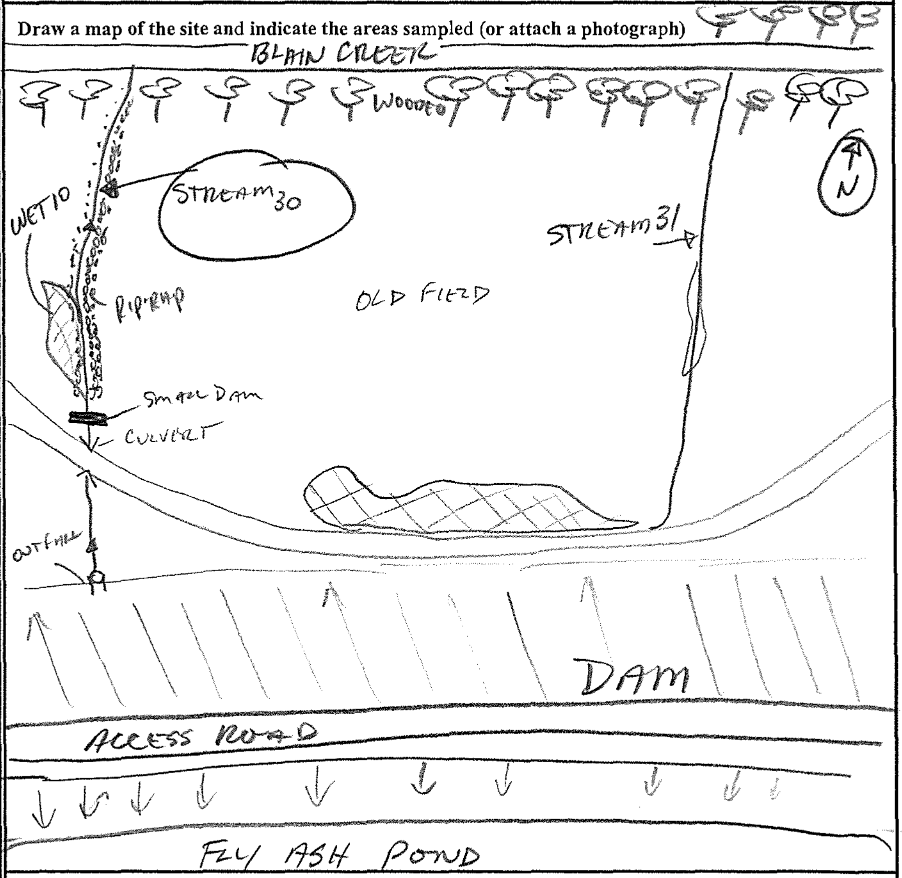
Has there been a heavy rain in the last 7 days?
• Yes • No

Air Temperature 85 °C

Other________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
[✓ • Perennial] • Intermittent • Tidal

Stream Type
• Coldwater [✓ • Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] DAM

Catchment Area______km²

STREAM 30

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [✓ Forest]
- [✓ Field/Pasture]
- Agricultural
- Residential
- Commercial
- Industrial
- [✓ Other] DAM FLYASH POND

Local Watershed NPS Pollution
- No evidence
- [✓ Some potential sources]
- Obvious sources

Local Watershed Erosion
- None
- [✓ Moderate]
- Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- Trees
- Shrubs
- [✓ Grasses]
- Herbaceous

dominant species present ______

INSTREAM FEATURES

Estimated Reach Length ______ ~~m~~

Estimated Stream Width 5-8 ~~m~~ ft.

Sampling Reach Area ______ ~~m²~~

Area in km² (m²x1000) ______ ~~km²~~

Estimated Stream Depth 18 ~~m~~ "

Surface Velocity (at thalweg) ______ ~~m/sec~~

Canopy Cover
- [✓ Partly open]
- Partly shaded
- Shaded

High Water Mark ______ m

Proportion of Reach Represented by Stream Morphology Types
- Riffle 40 %
- Run 50 %
- Pool 10 %

Channelized [✓ Yes] • No

Dam Present [✓ Yes] • No

LARGE WOODY DEBRIS NONE

LWD ——— m²

Density of LWD ______ m²/km² (LWD/ reach area)

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- [✓ Rooted emergent]
- Rooted submergent
- Rooted floating
- Free floating
- Floating Algae
- Attached Algae

dominant species present SWEETFLAG

Portion of the reach with aquatic vegetation 10 %

WATER QUALITY

Temperature ______ °C

Specific Conductance ______

Dissolved Oxygen ______

pH ______

Turbidity ______

WQ Instrument Used ______

Water Odors
- [✓ Normal/None]
- Sewage
- Petroleum
- Chemical
- Fishy
- Other ______

Water Surface Oils
- Slick
- Sheen
- Globs
- Flecks
- [✓ None]
- Other ______

Turbidity (if not measured)
- Clear
- Slightly turbid
- Turbid
- [✓ Opaque]
- Stained
- Other ______

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal]
- Sewage
- Petroleum
- Chemical
- Anaerobic
- None
- Other ______

Oils
- [✓ Absent]
- Slight
- Moderate
- Profuse

Deposits
- [✓ Sludge]
- Sawdust
- Paper fiber
- Sand
- Relict shells
- Other ______

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes
- [✓ No]

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	25			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	25			
Clay	< 0.004 mm (slick)				

RIP-RAP on BANKS & SUBSTRATE

STREAM 30

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME STR. 30	LOCATION AEP Big Sandy
STATION #________ RIVERMILE________	STREAM CLASS ______
LAT ____________ LONG ____________	RIVER BASIN ______
STORET #	AGENCY ____
INVESTIGATORS	
FORM COMPLETED BY	DATE ______ TIME ______ AM PM
	REASON FOR SURVEY POND CLOSURE

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 11	20 19 18 17 16	15 14 13 12 [✓ 11]	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 [✓ 14] 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0

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STREAM 30

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
18 **8. Bank Stability (score each bank)** Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
12 SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone) 2	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
41 SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0

Total Score 89

Old landfill outfall #3
Stream 31

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Outfall # 3	LOCATION AEP Bg Sandy
STATION #________ RIVERMILE________	STREAM CLASS —
LAT 38.188061 LONG -82.630791	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS MDT, PR	
FORM COMPLETED BY MDT, BAO	DATE 6/7/12 TIME 9:40 [✓ AM] PM
	REASON FOR SURVEY Pond Closure

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
___%•	%cloud cover	• ___%
•	clear/sunny	•

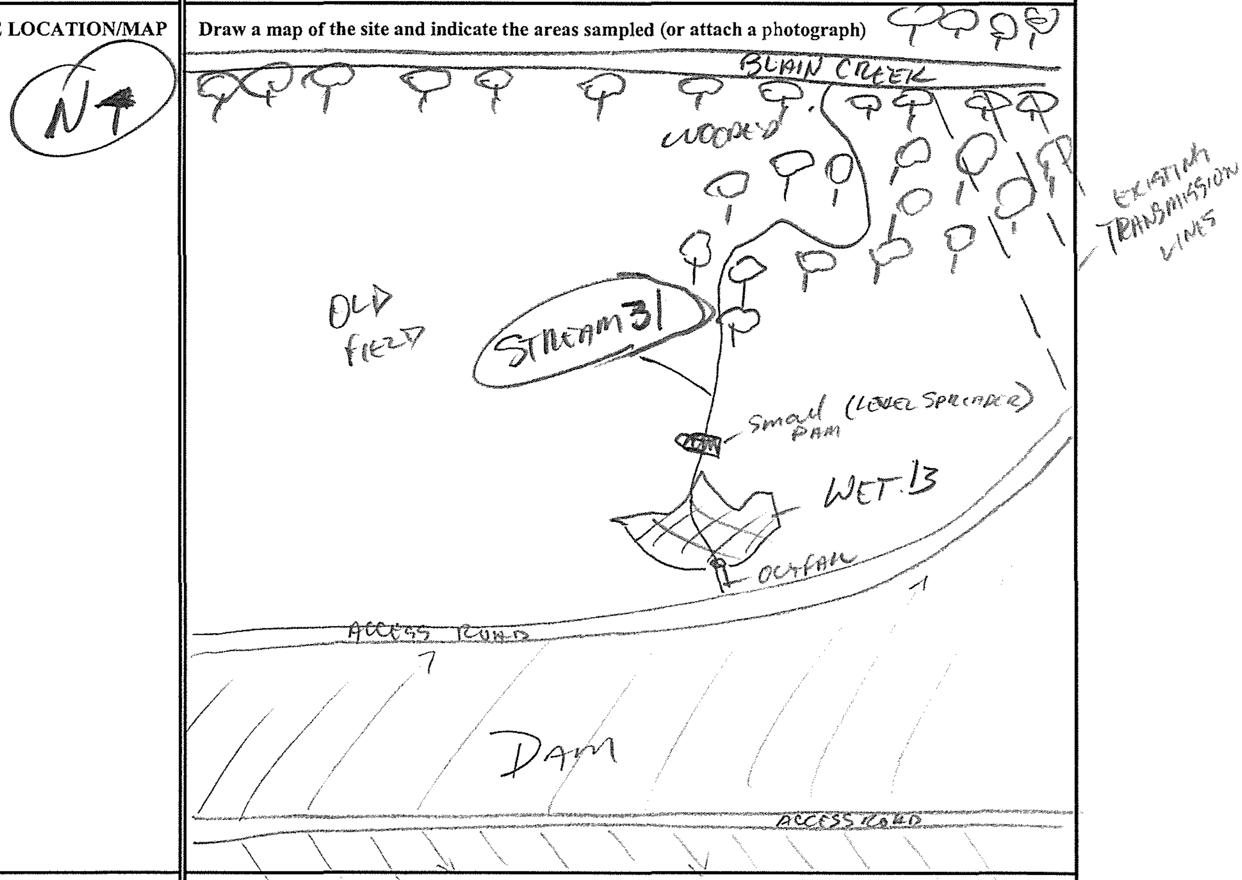
Has there been a heavy rain in the last 7 days?
• Yes • No

Air Temperature______ °C

Other________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
• Perennial [✓ • Intermittent] • Tidal

Stream Type
• Coldwater [✓ • Warmwater]

Stream Origin
• Glacial
• Non-glacial montane
• Swamp and bog
• Spring-fed
• Mixture of origins
• Other Dam
Fly Ash Pond

Catchment Area__________km²

Stream 31

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
[✓ Forest] • Commercial
[✓ Field/Pasture] • Industrial
• Agricultural [✓ Other] Dam
• Residential
Fly ash pond

Local Watershed NPS Pollution
• ~~No evidence~~ • Some potential sources
[✓ Obvious sources]

Local Watershed Erosion
• None [✓ Moderate] • Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
• Trees • Shrubs • Grasses [✓ Herbaceous]

dominant species present ____________________

INSTREAM FEATURES

Estimated Reach Length _______m
Estimated Stream Width 5 ~~m~~ Ft.
Sampling Reach Area _______m^2
Area in km^2 (m^2x1000) _______km^2
Estimated Stream Depth 3" ~~m~~ 8"
Surface Velocity (at thalweg) _______m/sec

Canopy Cover
[✓ Partly open] • Partly shaded • Shaded
High Water Mark _______m
Proportion of Reach Represented by Stream Morphology Types
• Riffle 10 % • Run 40 %
• Pool 50 %
Channelized [✓ Yes] • No
Dam Present [✓ Yes] • No

LARGE WOODY DEBRIS NONE

LWD _______m^2
Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
• Rooted emergent • Rooted submergent • Rooted floating • Free floating
[✓ Floating Algae] [✓ Attached Algae]

dominant species present ____________________

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

Temperature________ °C
Specific Conductance________
Dissolved Oxygen ________
pH ________
Turbidity ________
WQ Instrument Used ______________

Water Odors
[✓ Normal/None] • Sewage
• Petroleum • Chemical
• Fishy • Other______________

Water Surface Oils
• Slick • Sheen • Globs • Flecks
• None • Other______________

Turbidity (if not measured)
[✓ Clear] • Slightly turbid • Turbid
• Opaque • Stained • Other________

SEDIMENT/ SUBSTRATE

Odors
[✓ Normal] • Sewage • Petroleum
• Chemical • Anaerobic • None
• Other______________

Oils
[✓ Absent] • Slight • Moderate • Profuse

Deposits
• Sludge • Sawdust • Paper fiber • Sand
• Relict shells • Other______________

Looking at stones which are not deeply embedded, are the undersides black in color?
• Yes [✓ No]

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	20
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	30			
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	40			
Clay	< 0.004 mm (slick)				

STREAM 31

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME STREAM 31	LOCATION AEP BIG SANDY
STATION #_________ RIVERMILE_________	STREAM CLASS —
LAT 38.188061 LONG -82.630791	RIVER BASIN —
STORET #	AGENCY —
INVESTIGATORS	
FORM COMPLETED BY	DATE 06/07/12 TIME ________ AM PM REASON FOR SURVEY POND CLOSURE

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 9	20 19 18 17 16	15 14 13 12 11	10 [✓ 9] 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0

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Stream 31

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 4	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 [✓ 4] 3 2 1 0
	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
12	SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
12	SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
	SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
10	SCORE 5 (LB)	Left Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
	SCORE 5 (RB)	Right Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0

43

57

Total Score 80

landfill outfall 2
Stream 32

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME LANFILL OUTFALL 2	LOCATION AEP BIG SANDY
STATION # — RIVERMILE —	STREAM CLASS —
LAT 38.188102 LONG -82.63177	RIVER BASIN —
STORET # —	AGENCY —
INVESTIGATORS MDT, PR	
FORM COMPLETED BY MDT, BRO	DATE 06/7/12 TIME 0900 [✓ AM] PM
	REASON FOR SURVEY POND CLOSURE

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
____%•	%cloud cover	• ____%
•	clear/sunny	•

Has there been a heavy rain in the last 7 days?
• Yes • No

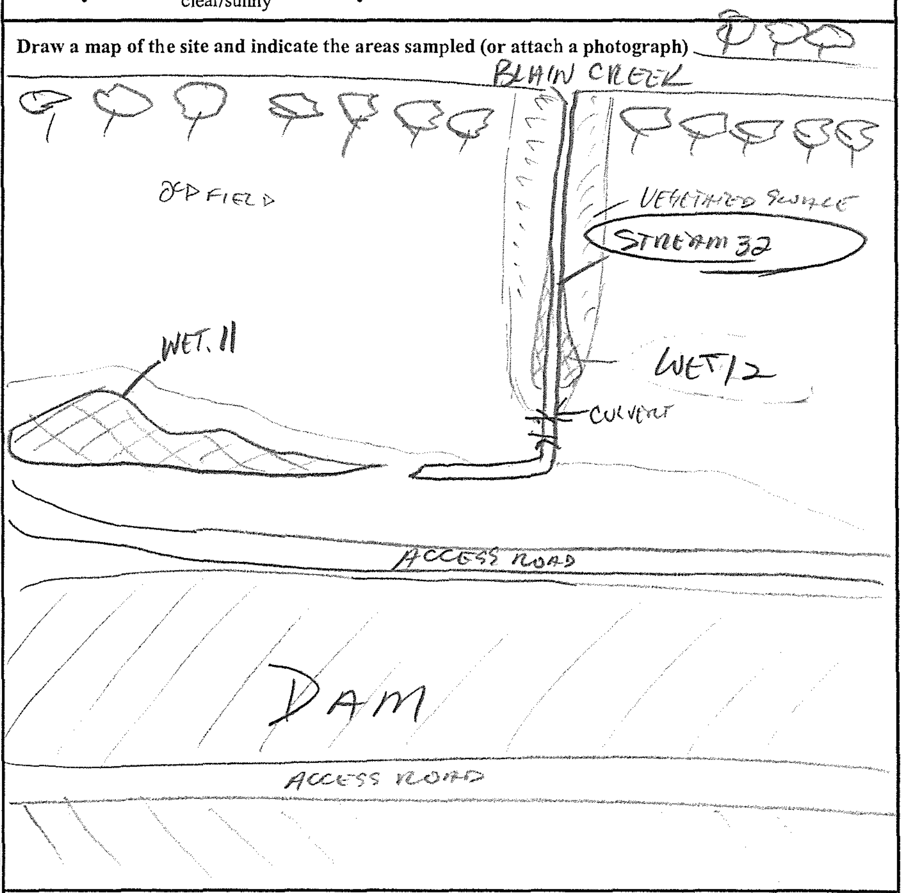
Air Temperature_____ °C

Other___________________________

SITE LOCATION/MAP

NA

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
• Perennial [✓ • Intermittent] • Tidal

Stream Type
• Coldwater [✓ • Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] Dam

Catchment Area__________km^2

STREAM 32

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [✓ Forest]
- [✓ Field/Pasture]
- Agricultural
- Residential
- Commercial
- Industrial
- Other Dam FLYASH POND

Local Watershed NPS Pollution
- No evidence
- [✓ Some potential sources]
- Obvious sources

Local Watershed Erosion
- None
- Moderate
- Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- Trees
- Shrubs
- [✓ Grasses]
- [✓ Herbaceous]

dominant species present GOLDENROD, MONEYWORT ETC

INSTREAM FEATURES

Estimated Reach Length _______ ~~m~~

Estimated Stream Width 5 ~~m~~ FT.

Sampling Reach Area _______ ~~m^2~~

Area in km^2 (m^2x1000) _______ km^2

Estimated Stream Depth 0 ~~m~~ IN.

Surface Velocity (at thalweg) _______ m/sec

Canopy Cover
- [✓ Partly open]
- Partly shaded
- Shaded

High Water Mark — m

Proportion of Reach Represented by Stream Morphology Types
- Riffle_______%
- Run_______% NO FLOW
- Pool_______%

Channelized [✓ Yes] • No

Dam Present [✓ Yes] • No

LARGE WOODY DEBRIS NONE

LWD _______ m^2

Density of LWD _______ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- [✓ Rooted emergent]
- Floating Algae
- Rooted submergent
- Attached Algae
- Rooted floating
- Free floating

dominant species present MONEYWORT, BONESET, CAREX SPP

Portion of the reach with aquatic vegetation 90 %

WATER QUALITY

Temperature _______ °C

Specific Conductance _______

Dissolved Oxygen _______

pH _______

Turbidity _______

WQ Instrument Used _______________

Water Odors
- [✓ Normal/None]
- Sewage
- Petroleum
- Chemical
- Fishy
- Other_______________

Water Surface Oils
- Slick
- Sheen
- Globs
- Flecks
- [✓ None]
- Other_______________

Turbidity (if not measured)
- Clear
- Slightly turbid
- Turbid
- Opaque
- Stained
- [✓ Other] NO FLOW

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal]
- Sewage
- Petroleum
- Chemical
- Anaerobic
- None
- Other_______________

Oils
- [✓ Absent]
- Slight
- Moderate
- Profuse

Deposits
- Sludge
- Sawdust
- Paper fiber
- Sand
- Relict shells
- Other_______________

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes
- No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	20
Gravel	2-64 mm (0.1"-2.5")	40
Sand	0.06-2mm (gritty)	
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Characteristic**	**% Composition in Sampling Area**
Detritus	sticks, wood, coarse plant materials (CPOM)	30
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

STREAM 32

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Stream 31	LOCATION AEP Big Sandy
STATION #________ RIVERMILE________	STREAM CLASS
LAT ________ LONG ________	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS	
FORM COMPLETED BY MPT, BAD	DATE 06/07/12 TIME 0900 [✓ AM] PM REASON FOR SURVEY Pond Closure

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 [✓ 3] 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

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STREAM 32

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
16 SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces . covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10 SCORE 5 (LB)	Left Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
35 8 SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0

Total Score 62

Stream 44
5-md+5/15/2012-7

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME 5-md+5/15/12-7 Horsecoal Creek	LOCATION Big Sandy Plant; Lawrence Co, KY
STATION #________ RIVERMILE________	STREAM CLASS
LAT 38.18353 LONG -82.65165	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS M.Thomeyer, B. Otto	
FORM COMPLETED BY M.Thomeyer, B.Otto ; URS Corp	DATE 15 May 2012 TIME 1713 AM [✓ PM]
	REASON FOR SURVEY Landfill

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
___%•	%cloud cover	• ___%
•	[✓ clear/sunny]	•

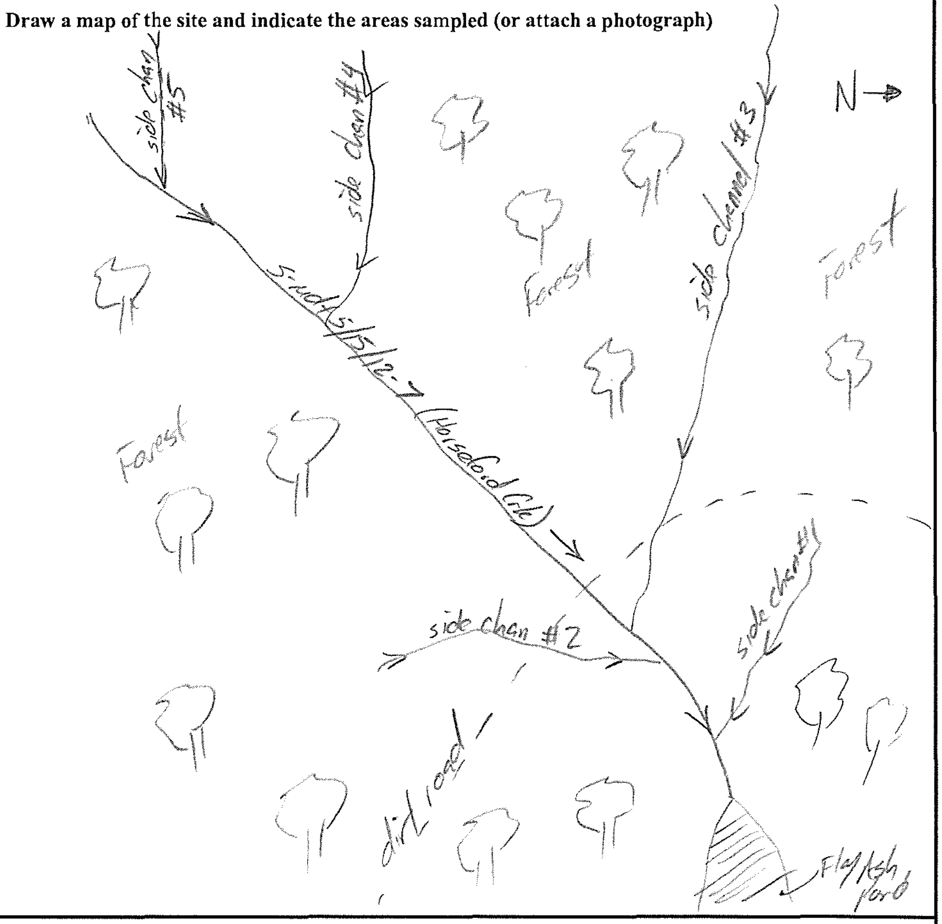
Has there been a heavy rain in the last 7 days?
• Yes [✓ • No]

Air Temperature_____ °C

Other____________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



several photos were also taken

STREAM CHARACTERIZATION

Stream Subsystem
[✓ • Perennial] • Intermittent • Tidal

Stream Type
• Coldwater [✓ • Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] slope

Catchment Area_________km²

Stream 44
5-UDT 5/15/2012-7

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [✓ Forest]
- Field/Pasture
- Agricultural
- Residential
- Commercial
- Industrial
- Other ____________

Local Watershed NPS Pollution
- [✓ No evidence]
- Some potential sources
- Obvious sources

Local Watershed Erosion
- None
- Moderate
- Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- [✓ Trees]
- Shrubs
- Grasses
- Herbaceous

dominant species present Mixed mes - oak-maple-hick-beech

INSTREAM FEATURES

Estimated Reach Length 2,379 ~~m~~ ft

Estimated Stream Width 2-12' ~~m~~ ft

Sampling Reach Area _______ m^2

Area in km^2 (m^2x1000) _______ km^2

Estimated Stream Depth 6" ~~m~~ mpd

Surface Velocity (at thalweg) _______ m/sec

Canopy Cover
- Partly open
- Partly shaded
- [✓ Shaded]

High Water Mark 1' ~~m~~ foot

Proportion of Reach Represented by Stream Morphology Types
- Riffle 60 %
- Run 30 %
- Pool 10 %

Channelized • Yes [✓ No]

Dam Present • Yes [✓ No]

LARGE WOODY DEBRIS

LWD _______ m^2 lots of woody debris

Density of LWD _______ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- Rooted emergent
- Rooted submergent
- Rooted floating
- Free floating
- Floating Algae
- Attached Algae

dominant species present None

Portion of the reach with aquatic vegetation 0 %

WATER QUALITY

Temperature _______ °C

Specific Conductance _______

Dissolved Oxygen _______

pH _______

Turbidity _______

WQ Instrument Used _______________

Not sampled

Water Odors
- [✓ Normal/None]
- Sewage
- Petroleum
- Chemical
- Fishy
- Other ____________

Water Surface Oils
- Slick
- Sheen
- Globs
- Flecks
- [✓ None]
- Other ____________

Turbidity (if not measured)
- Clear
- [✓ Slightly turbid]
- Turbid
- Opaque
- Stained
- Other _______

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal]
- Sewage
- Petroleum
- Chemical
- Anaerobic
- None
- Other ____________

Oils
- [✓ Absent]
- Slight
- Moderate
- Profuse

Deposits
- Sludge
- Sawdust
- Paper fiber
- [✓ Sand]
- Relict shells
- Other ____________

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes
- [✓ No]

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**
Bedrock		15
Boulder	> 256 mm (10")	15
Cobble	64-256 mm (2.5"-10")	40
Gravel	2-64 mm (0.1"-2.5")	15
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Characteristic**	**% Composition in Sampling Area**
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Stream 44
s-ndt5/15/2012-7

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME s-ndt5/15/12-7 Horseford Crk	LOCATION Big Sandy Plant; Lawrence Co, KY
STATION # ________ RIVERMILE ________	STREAM CLASS
LAT 38.18353 LONG -82.65165	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS M. Thomayer, B. Otto	
FORM COMPLETED BY M. Thomayer, B. Otto; URS	DATE 15 May 2012 TIME 1713 AM [✓ PM]
	REASON FOR SURVEY Landfill

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 17	20 19 18 [✓ 17] 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 17	20 19 18 [✓ 17] 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 11	20 19 18 17 16	15 14 13 12 [✓ 11]	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 15	20 19 18 17 16	[✓ 15] 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0

73

Stream 44
5-udt 5/15/2012-7

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 17	20 19 18 [✓ 17] 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0

69

Total Score 142

Stream 68

5-pr 6/06/2012-2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME 5-pr 6/06/2012-2	LOCATION Big Sandy Plant, Lawrence Co, KY
STATION #_______ RIVERMILE_______	STREAM CLASS
LAT 38.17564 LONG -82.64765	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS M. Thomayer, B. Otto	
FORM COMPLETED BY M. Thomayer, B. Otto, ORS Corp	DATE 6 June 2012 TIME 1227 AM [✓ PM] REASON FOR SURVEY Land Fill

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
___%•	%cloud cover	• ___%
•	[✓ clear/sunny]	•

Has there been a heavy rain in the last 7 days?
- Yes [✓ No]

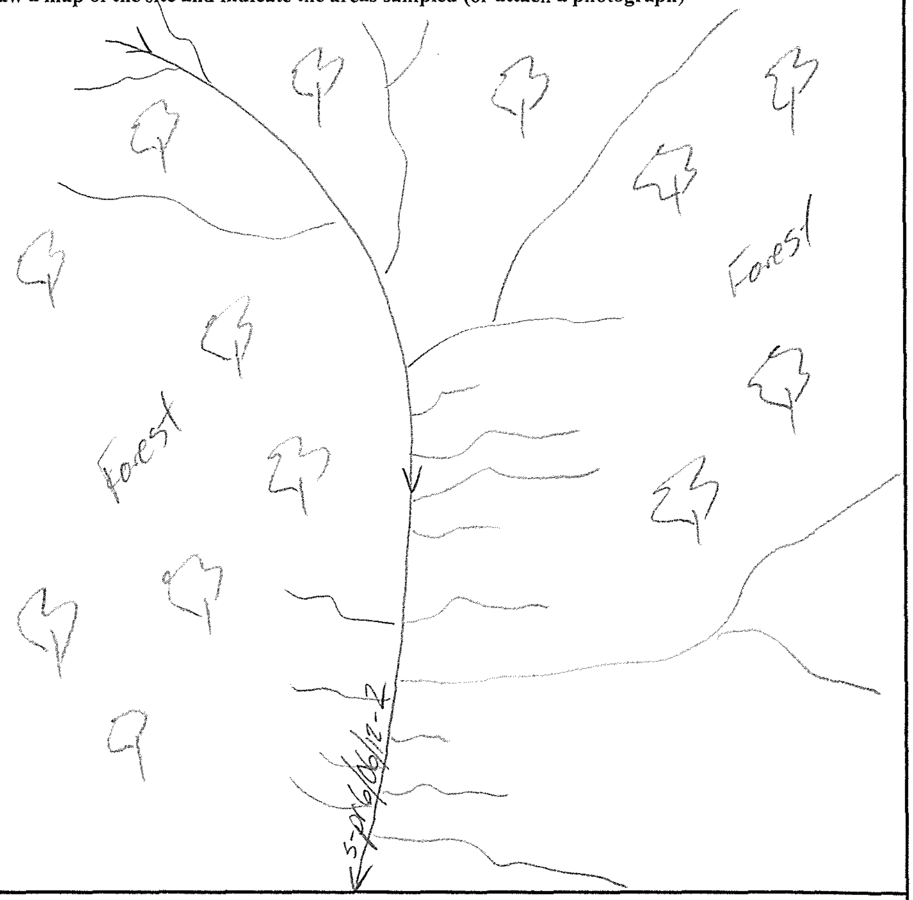
Air Temperature_____ °C

Other______________________

SITE LOCATION/MAP

several photos were also taken

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
- [✓ Perennial] • Intermittent • Tidal

Stream Type
- Coldwater [✓ Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] slope

Catchment Area_________km²

Stream 68
5-pr 6/06/2012-2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [✓ Forest]
- Field/Pasture
- Agricultural
- Residential
- Commercial
- Industrial
- Other ______

Local Watershed NPS Pollution
- [✓ No evidence]
- Some potential sources
- Obvious sources

Local Watershed Erosion
- [✓ None]
- [✓ Moderate]
- Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- [✓ Trees]
- Shrubs
- Grasses
- Herbaceous

dominant species present Mixed mes: oak-maple-hickory-beech

INSTREAM FEATURES

Estimated Reach Length 1,405 ~~m~~ ft
Estimated Stream Width 6-14 ~~m~~ ft
Sampling Reach Area ______ m^2
Area in km^2 (m^2x1000) ______ km^2
Estimated Stream Depth 6-12" ~~m~~ in
Surface Velocity (at thalweg) ______ m/sec

Canopy Cover
- Partly open
- Partly shaded
- [✓ Shaded]

High Water Mark 1.5 ~~m~~ ft

Proportion of Reach Represented by Stream Morphology Types
- Riffle 45 %
- Run 30 %
- Pool 25 %

Channelized • Yes [✓ No]
Dam Present • Yes [✓ No]

LARGE WOODY DEBRIS

LWD ______ m^2
Density of LWD ______ m^2/km^2 **(LWD/ reach area)**

Lots of woody debris

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- Rooted emergent
- Rooted submergent
- Rooted floating
- Free floating
- Floating Algae
- Attached Algae

dominant species present None
Portion of the reach with aquatic vegetation 0 %

WATER QUALITY

Temperature ______ °C
Specific Conductance ______
Dissolved Oxygen ______
pH ______
Turbidity ______
WQ Instrument Used ______

did not sample

Water Odors
- [✓ Normal/None]
- Sewage
- Petroleum
- Chemical
- Fishy
- Other ______

Water Surface Oils
- Slick
- Sheen
- Globs
- Flecks
- [✓ None]
- Other ______

Turbidity (if not measured)
- [✓ Clear]
- Slightly turbid
- Turbid
- Opaque
- Stained
- Other ______

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal]
- Sewage
- Petroleum
- Chemical
- Anaerobic
- None
- Other ______

Oils
- [✓ Absent]
- Slight
- Moderate
- Profuse

Deposits
- Sludge
- Sawdust
- Paper fiber
- Sand
- Relict shells
- Other ______

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes
- [✓ No]

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		10
Boulder	> 256 mm (10")	30
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	25
Sand	0.06-2mm (gritty)	5
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Stream 68

5-pr 6/06/2012-2

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME 5-pr 6/06/2012-2	LOCATION Big Sandy Plant; Lawrence Co, KY	
STATION # ________ RIVERMILE ________	STREAM CLASS	
LAT 38.17564 LONG 82.64765	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS M-Thomayer, B-Otto		
FORM COMPLETED BY M-Thomayer, B.Otto; URS Corp	DATE 6 June 2012 TIME 1227 AM [✓ PM]	REASON FOR SURVEY Landfill

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 14	20 19 18 17 16	15 [✓ 14] 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 16	20 19 18 17 [✓ 16]	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
89	**SCORE** 13	20 19 18 17 16	15 14 [✓ 13] 12 11	10 9 8 7 6	5 4 3 2 1 0

Stream 68
5-pr 6/06/2012-2

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 7 (LB)	Left Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

78

Total Score 167

Stream 71

s-mdt 5/15/2012-7 side Channel #

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME s-mdt 5/15/12-7 side #3	LOCATION Big Sandy Plant; Lawrence Co, KY
STATION #________ RIVERMILE________	STREAM CLASS
LAT 38.18557 LONG -82.65327	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS M. Thomayer, B. Otto,	

FORM COMPLETED BY M. Thomayer, B. Otto, URS Corp	DATE 15 May 2012 TIME 1358 AM [✓ PM]	REASON FOR SURVEY Landfill

WEATHER CONDITIONS

Now		Past 24 hours
•	storm (heavy rain)	•
•	rain (steady rain)	•
•	showers (intermittent)	•
____%•	%cloud cover	• ____%
•	[✓ clear/sunny]	•

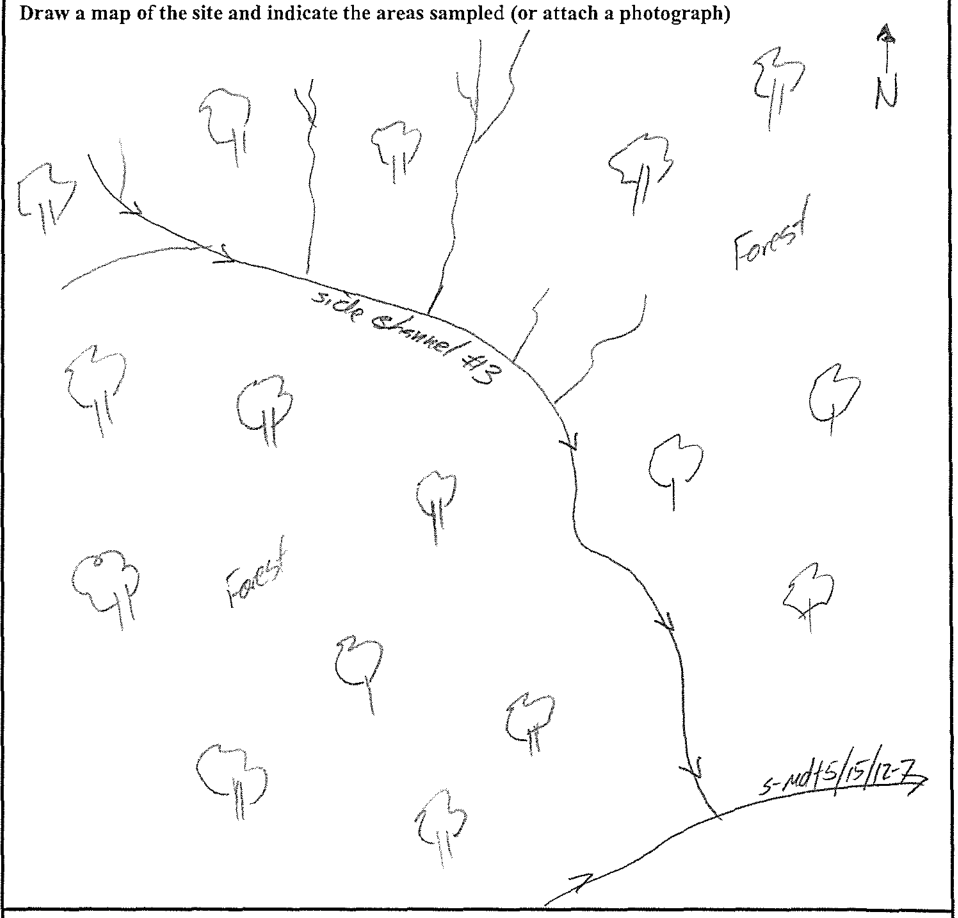
Has there been a heavy rain in the last 7 days?
- Yes [✓ No]

Air Temperature_____ °C

Other____________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
- Perennial [✓ Intermittent] • Tidal

Stream Type
- Coldwater [✓ Warmwater]

Stream Origin
- Glacial
- Non-glacial montane
- Swamp and bog
- Spring-fed
- Mixture of origins
- [✓ Other] Slope

Catchment Area_________km²

Stream #1

57MDH 5/15/12-7 side channel #3

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [✓ Forest]
- Field/Pasture
- Agricultural
- Residential
- Commercial
- Industrial
- Other ______________

Local Watershed NPS Pollution
- [✓ No evidence]
- Some potential sources
- Obvious sources

Local Watershed Erosion
- None
- Moderate
- Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- [✓ Trees]
- Shrubs
- Grasses
- Herbaceous

dominant species present Mixed mes oak-maple-hickory-beech

INSTREAM FEATURES

Estimated Reach Length 1,815 ~~m~~ ft

Estimated Stream Width 4-6' ~~m~~ ft

Sampling Reach Area _______m²

Area in km² (m²x1000) _______km²

Estimated Stream Depth 2" ~~m~~ in mpd

Surface Velocity (at thalweg) _______m/sec

Canopy Cover
- Partly open
- Partly shaded
- [✓ Shaded]

High Water Mark 1' ~~m~~ ft

Proportion of Reach Represented by Stream Morphology Types
- Riffle 40 %
- Run 40 %
- Pool 20 %

Channelized • Yes [✓ No]

Dam Present • Yes [✓ No]

LARGE WOODY DEBRIS

LWD _______m²

Density of LWD _______m²/km² (LWD/ reach area)

Lots of woody debris

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- Rooted emergent
- Rooted submergent
- Rooted floating
- Free floating
- Floating Algae
- Attached Algae

dominant species present None

Portion of the reach with aquatic vegetation 0 %

WATER QUALITY

Temperature_______ °C

Specific Conductance_______

Dissolved Oxygen _______

pH _______

Turbidity _______

WQ Instrument Used _______________

Not sampled

Water Odors
- [✓ Normal/None]
- Sewage
- Petroleum
- Chemical
- Fishy
- Other______________

Water Surface Oils
- Slick
- Sheen
- Globs
- Flecks
- [✓ None]
- Other______________

Turbidity (if not measured)
- [✓ Clear]
- Slightly turbid
- Turbid
- Opaque
- Stained
- Other_______

SEDIMENT/ SUBSTRATE

Odors
- [✓ Normal]
- Sewage
- Petroleum
- Chemical
- Anaerobic
- None
- Other______________

Oils
- [✓ Absent]
- Slight
- Moderate
- Profuse

Deposits
- Sludge
- Sawdust
- Paper fiber
- [✓ Sand]
- Relict shells
- Other______________

Looking at stones which are not deeply embedded, are the undersides black in color?
- Yes
- [✓ No]

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**
Bedrock		
Boulder	> 256 mm (10")	15
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	10

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Characteristic**	**% Composition in Sampling Area**
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Stream 71

5-udt 5/15/2012-7 side channel #3

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME 5-udt 5/15/12-7 side #3
LOCATION Big Sandy Plant, Lawrence Co, KY
STATION #________ RIVERMILE________
STREAM CLASS
LAT 38.18557 LONG -82.65327
RIVER BASIN
STORET #
AGENCY
INVESTIGATORS M. Thomayer, B. Otto
FORM COMPLETED BY M. Thomayer, B. Otto; ORS Corp
DATE 15 May 2012
TIME 1358 AM [✓ PM]
REASON FOR SURVEY Landfill

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 13	20 19 18 17 16	15 14 [✓ 13] 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 15	20 19 18 17 16	[✓ 15] 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 13	20 19 18 17 16	15 14 [✓ 13] 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0

55

Stream 71

STMd+5/15/2012 - 7 side Channel/#3

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 14	20 19 18 17 16	15 [✓ 14] 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 13	20 19 18 17 16	15 14 [✓ 13] 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 7 (LB)	Left Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 7 (LB)	Left Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0

63

Total Score 118

APPENDIX E

DELINEATED FEATURES PHOTOGRAPHS

E1 – WETLANDS

PHOTOGRAPHIC RECORD

Wetlands

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 1

Date:

May 23, 2012

Description:

Wetland 1

Facing southwest

PEM/PSS

Photo No. 2

Date:

May 23, 2012

Description:

Wetland 2

Facing east

PEM

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 3

Date:

May 24, 2012

Description:

Wetland 3

Facing north

PEM

Photo No. 4

Date:

May 24, 2012

Description:

Wetland 4

Facing west

PEM

Client Name: Dames & Moore AEP	**Site Location:** Big Sandy Pond Closure Project	**Project No.** 13815152

Photo No. **5**

Date:

May 24, 2012

Description:

Wetland 5

Facing south

PEM

Photo No. **6**

Date:

May 24, 2012

Description:

Wetland 6

Facing northwest

PEM/PSS

Client Name: Dames & Moore	**Site Location:**	**Project No.**
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 7

Date:

May 24, 2012

Description:

Wetland 7

Facing northeast

PEM

Photo No. 8

Date:

May 24, 2012

Description:

Wetland 8

Facing north

PEM

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 9

Date:

June 5, 2012

Description:

Wetland 9

Facing northeast

PEM/PSS

Photo No. 10

Date:

June 7, 2012

Description:

Wetland 10

Facing west

PEM

Photo No. 11

Date:

June 7, 2012

Description:

Wetland 11

Facing north

PEM

Photo No. 12

Date:

June 7, 2012

Description:

Wetland 12

Facing north

PEM

Photo No. 13

Date:

June 7, 2012

Description:

Wetland 13

Facing southeast

PEM

Photo No. 14

Date:

October 15, 2012

Description:

Wetland 14

Facing north

PEM/PSS

Photo No. 15	
Date: October 15, 2012	
Description: Wetland 15 Facing east PEM	

Photo No. 16	
Date: October 15, 2012	
Description: Wetland 16 Facing east PEM/PSS	

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. **17**

Date:

October 15, 2012

Description:

Wetland 17

Facing east

PFO

E2 –STREAMS

Client Name: Dames & Moore AEP	Site Location: Big Sandy Pond Closure Project	Project No. 13815152

Photo No. 1

Date:

May 2, 2012

Description:

Stream 1

Facing downstream

Ephemeral stream

Photo No. 2

Date:

May 2, 2012

Description:

Stream 2

Facing upstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 3

Date:

May 2, 2012

Description:

Stream 3

Facing downstream

Ephemeral stream

Photo No. 4

Date:

October 15, 2012

Description:

Stream 4

Facing Downstream

Intermittent stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 5

Date:

October 15, 2012

Description:

Stream 5

Facing Upstream

Ephemeral stream

Photo No. 6

Date:

May 2, 2012

Description:

Stream 6

Facing upstream

Ephemeral stream

Photo No. 7

Date:

May 2, 2012

Description:

Stream 7

Facing upstream

Ephemeral stream

Photo No. 8

Date:

May 2, 2012

Description:

Stream 8

Facing upstream

Ephemeral Stream

Photo No. 9

Date:

May 2, 2012

Description:

Stream 9

Facing upstream

Ephemeral stream

Photo No. 10

Date:

May 3, 2012

Description:

Stream 10

Facing upstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 11

Date:

May 3, 2012

Description:

Stream 11

Facing upstream

Intermittent stream

Photo No. 12

Date:

May 3, 2012

Description:

Stream 12

Facing downstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 13

Date:

May 3, 2012

Description:

Stream 13

Facing upstream

Intermittent stream

Photo No. 14

Date:

May 4, 2012

Description:

Stream 14

Facing upstream

Ephemeral stream

Photo No. 15

Date:

May 4, 2012

Description:

Stream 15

Facing upstream

Intermittent stream

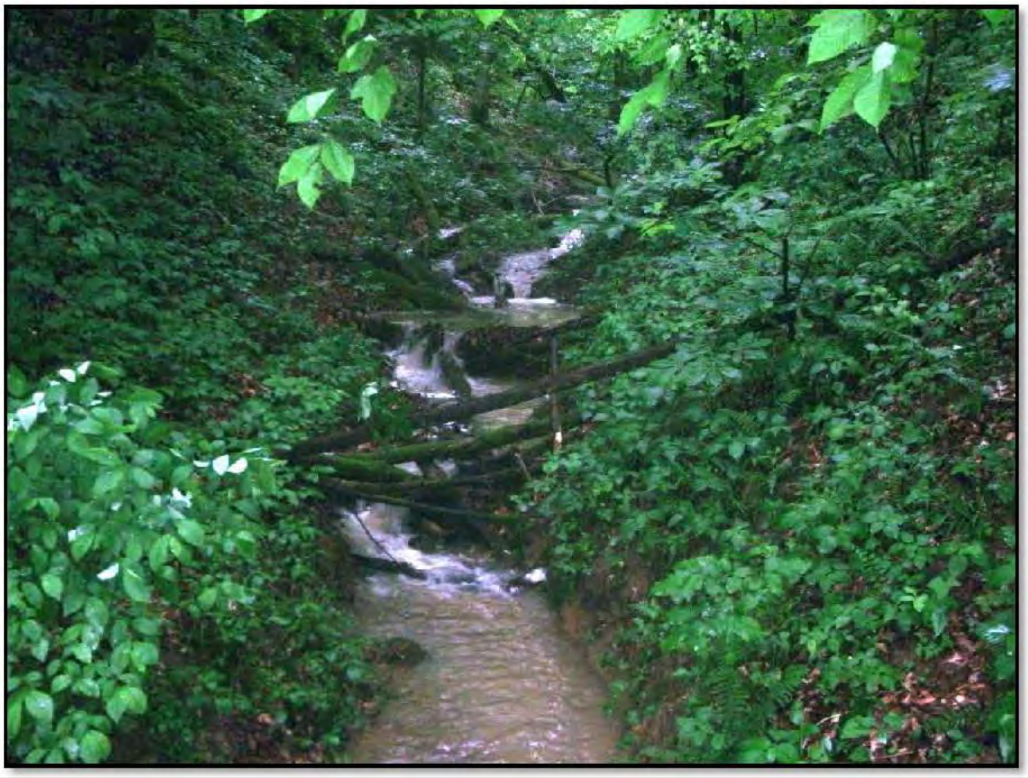


Photo No. 16

Date:

May 4, 2012

Description:

Stream 16

Facing downstream

Ephemeral stream

Photo No. **17**

Date:

May 15, 2012

Description:

Stream 17

Facing upstream

Intermittent stream

Photo No. **18**

Date:

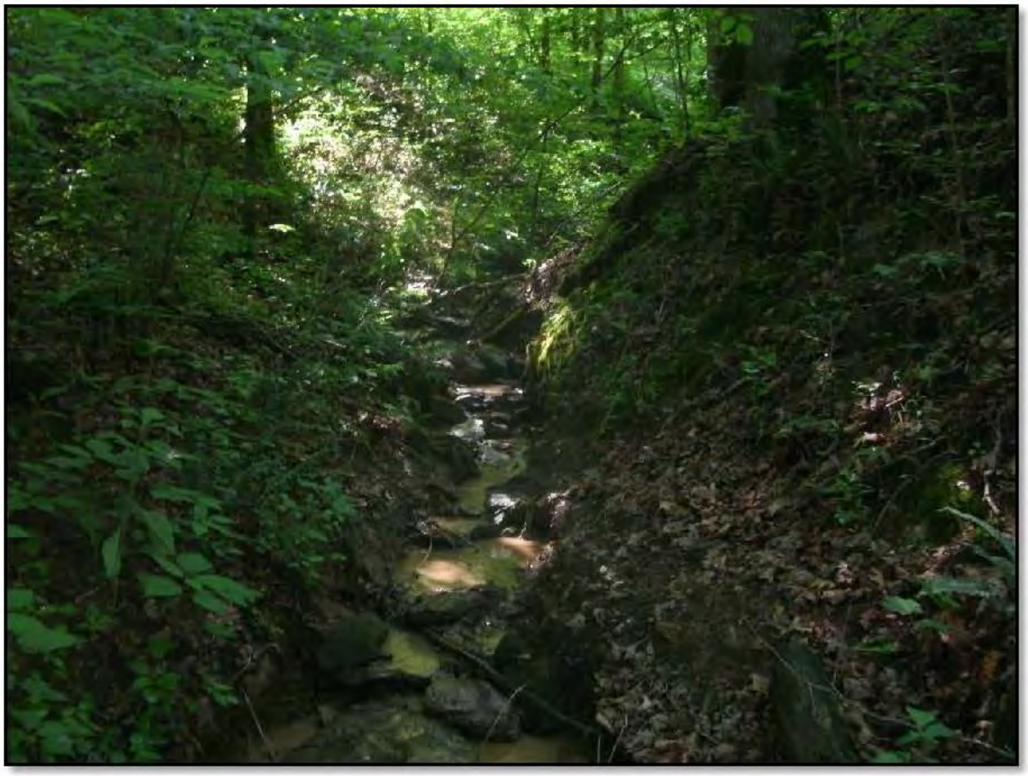
May 15, 2012

Description:

Stream 18

Facing upstream

Intermittent stream



Client Name:	**Site Location:**	**Project No.**
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 19

Date:

May 15, 2012

Description:

Stream 19

Facing upstream

Ephemeral stream

Photo No. 20

Date:

May 15, 2012

Description:

Stream 20

Facing upstream

Ephemeral stream

Client Name: Dames & Moore	**Site Location:**	**Project No.**
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 21

Date:

May 24, 2012

Description:

Stream 21

Facing upstream

Ephemeral stream

Photo No. 22

Date:

May 24, 2012

Description:

Stream 22

Facing downstream

Intermittent stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 23

Date:

May 24, 2012

Description:

Stream 23

Facing downstream

Ephemeral stream

Photo No. 24

Date:

May 24, 2012

Description:

Stream 24

Facing downstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 25

Date:

May 24, 2012

Description:

Stream 25

Facing downstream

Ephemeral stream

Photo No. 26

Date:

October 15, 2012

Description:

Stream 26

Facing downstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 27

Date:

October 15, 2012

Description:

Stream 27

Facing upstream

Ephemeral stream

Photo No. 28

Date:

October 15, 2012

Description:

Stream 28

Facing downstream

Ephemeral stream

PHOTOGRAPHIC RECORD

Streams

Client Name: Dames & Moore	**Site Location:**	**Project No.**
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 29

Date:

October 15, 2012

Description:

Stream 29

Facing downstream

Ephemeral stream

Photo No. 30

Date:

June 7, 2012

Description:

Stream 30

Landfill Outfall

Facing upstream

Perennial Stream

PHOTOGRAPHIC RECORD
Streams

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 31

Date:

June 7, 2012

Description:

Stream 31

Landfill Outfill

Intermittent Stream

Photo No. 32

Date:

June 7, 2012

Description:

Stream 32

Former Landfill Outfall

Facing downstream

Intermittent Stream

Photo No. 33

Date:

May 3, 2012

Description:

Stream 33

Facing downstream

Ephemeral stream

Photo No. 34

Date:

May 3, 2012

Description:

Stream 34

Facing upstream

Ephemeral stream

Photo No. 35

Date:

May 3, 2012

Description:

Stream 35

Facing downstream

Intermittent stream

Photo No. 36

Date:

May 4, 2012

Description:

Stream 36

Facing upstream

Ephemeral stream

Photo No. 37

Date:

May 4, 2012

Description:

Stream 37

Facing upstream

Ephemeral stream

Photo No. 38

Date:

May 15, 2012

Description:

Stream 38

Facing downstream

Ephemeral stream

Client Name: Dames & Moore AEP	**Site Location:** Big Sandy Pond Closure Project	**Project No.** 13815152

Photo No. 39

Date:

May 15, 2012

Description:

Stream 39

Facing downstream

Intermittent stream

Photo No. 40

Date:

May 15, 2012

Description:

Stream 40

Facing upstream

Ephemeral stream

Client Name: Dames & Moore	**Site Location:**	**Project No.**
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 41

Date:

May 15, 2012

Description:

Stream 41

Facing upstream

Intermittent stream

Photo No. 42

Date:

May 15, 2012

Description:

Stream 42

Facing downstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 43

Date:

May 15, 2012

Description:

Stream 43

Facing upstream

Ephemeral stream

Photo No. 44

Date:

May 15, 2012

Description:

Stream 44

Facing upstream

Perennial stream

Photo No. 45

Date:

May 24, 2012

Description:

Stream 45

Facing upstream

Ephemeral stream

Photo No. 46

Date:

May 24, 2012

Description:

Stream 46

Facing downstream

Intermittent stream

Photo No. 47

Date:

May 24, 2012

Description:

Stream 47

Facing upstream

Ephemeral stream

Photo No. 48

Date:

May 24, 2012

Description:

Stream 48

Facing downstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 49

Date:

May 24, 2012

Description:

Stream 49

Facing downstream

Ephemeral stream

Photo No. 50

Date:

May 24, 2012

Description:

Stream 50

Facing downstream

Ephemeral stream

Photo No. 51

Date:

May 24, 2012

Description:

Stream 51

Ephemeral stream

Photo No. 52

Date:

June 5, 2012

Description:

Stream 52

Facing downstream

Ephemeral stream

Photo No. 53

Date:

June 5, 2012

Description:

Stream 53

Facing downstream

Ephemeral stream

Photo No. 54

Date:

June 5, 2012

Description:

Stream 54

Facing downstream

Ephemeral stream

Photo No. 55

Date:

June 5, 2012

Description:

Stream 55

Facing downstream

Ephemeral stream

Photo No. 56

Date:

June 5, 2012

Description:

Stream 56

Facing downstream

Ephemeral stream

PHOTOGRAPHIC RECORD
Streams

Client Name: Dames & Moore AEP	**Site Location:** Big Sandy Pond Closure Project	**Project No.** 13815152

Photo No. 57

Date:

June 6, 2012

Description:

Stream 57

Ephemeral stream

Photo No. 58

Date:

June 6, 2012

Description:

Stream 58

Facing downstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 59

Date:

June 6, 2012

Description:

Stream 59

Ephemeral stream

Photo No. 60

Date:

June 6, 2012

Description:

Stream 60

Ephemeral stream

Photo No. 61

Date:

June 5, 2012

Description:

Stream 61

Facing upstream

Ephemeral stream

Photo No. 62

Date:

June 5, 2012

Description:

Stream 62

Facing upstream

Ephemeral stream

Photo No. 63

Date:

June 5, 2012

Description:

Stream 63

Facing upstream

Ephemeral stream

Photo No. 64

Date:

June 5, 2012

Description:

Stream 64

Facing upstream

Ephemeral stream

Photo No. 65

Date:

June 5, 2012

Description:

Stream 65

Facing downstream

Ephemeral stream

Photo No. 66

Date:

June 5, 2012

Description:

Stream 66

Facing downstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 67

Date:

June 6, 2012

Description:

Stream 67

Facing downstream

Ephemeral stream

Photo No. 68

Date:

June 6, 2012

Description:

Stream 68

Perennial stream

Photo No. 69

Date:

June 6, 2012

Description:

Stream 69

Ephemeral stream

(no photo available)

Photo No. 70

Date:

May 15, 2012

Description:

Stream 70

Facing upstream

Intermittent stream

Photo No. 71

Date:

May 23, 2012

Description:

Stream 71

Facing upstream

Intermittent stream

Photo No. 72

Date:

October 15, 2012

Description:

Stream 72

Facing downstream

Ephemeral stream

Photo No. **73**

Date:

October 15, 2012

Description:

Stream 73

Facing upstream

Ephemeral stream

Photo No. **74**

Date:

October 15, 2012

Description:

Stream 74

Facing upstream

Ephemeral stream

Client Name: Dames & Moore	Site Location:	Project No.
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 75

Date:

October 15, 2012

Description:

Stream 75

Facing downstream

Ephemeral stream

Photo No. 76

Date:

October 15, 2012

Description:

Stream 76

Facing upstream

Ephemeral stream

Client Name: Dames & Moore	**Site Location:**	**Project No.**
AEP	Big Sandy Pond Closure Project	13815152

Photo No. 77	
Date: October 15, 2012	
Description: Stream 77 Facing upstream Ephemeral stream	

Photo No. 78	
Date: October 15, 2012	
Description: Stream 78 Facing downstream Ephemeral stream	

Client Name: Dames & Moore AEP	**Site Location:** Big Sandy Pond Closure Project	**Project No.** 13815152

Photo No. 79

Date:

October 15, 2012

Description:

Stream 79

Facing upstream

Ephemeral stream

Photo No. 80

Date:

October 15, 2012

Description:

Stream 80

Facing downstream

Ephemeral stream

E3 – PONDS

PHOTOGRAPHIC RECORD

Ponds

Client Name: Dames & Moore AEP	**Site Location:** Big Sandy Pond Closure Project	**Project No.** 13815152

Photo No. 1

Date:

May 4, 2012

Description:

Pond 1

Facing southwest

February 6, 2015

Jill Lukehart
American Electric Power
Environmental Services – Water and Ecological Resource Services
1 Riverside Plaza
Columbus, Ohio 43215

Subject: **Addendum Wetland Delineation and Stream Assessment of the Big Sandy Fly Ash Pond Closure Project; Lawrence County, Kentucky**

Dear Ms. Lukehart,

URS is pleased to provide the following addendum to the Wetland Delineation and Stream Assessment Report (*Initial Report*) that was prepared in May 2013 for the Big Sandy Fly Ash Pond Closure Project ("Project") in Lawrence County, Kentucky. As described in the *Initial Report*, the purpose of this Project is to permanently close the Big Sandy Fly Ash Pond in accordance with Federal Regulations pertaining to wet ash impoundments. During the initial survey, an approximately 16-acre property north of the fly ash pond was evaluated along with the approximately 602-acre Project survey area. The 16-acre property was not included in the survey results within the *Initial Report* since the original Project design did not include this area within the limits of disturbance. Since the time of the *Initial Report*, AEP has placed an emphasis on avoiding and minimizing wetland and stream impacts throughout the Project area. The emphasis on avoidance has required adjustments to the overall cap design and borrow areas needed for fill. Within the revised limits of disturbance, the approximately 16-acre property has been designed as a new borrow area for the Project.

This addendum provides a summary of the wetland and stream evaluation conducted by URS on June 7, 2012, within the approximately 16-acre borrow area. The addendum survey boundary is illustrated on Figure 1 in Attachment A.

The ecological assessment for this Project was conducted by qualified URS biologists. The field assessment was comprised of a U.S. Army Corps of Engineers (USACE) jurisdictional wetland delineation and Ohio Rapid Assessment Method Wetlands v. 5.0 (ORAM) for wetlands, along with U.S. EPA Rapid Bioassessment (RBA) Protocols for surface drainages.

METHODS

The purpose of the field survey was to assess whether evidence of wetlands and “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 to identify the occurrence and location of potential wetland areas.

The ecological assessments on June 7, 2012, were conducted by qualified URS biologists that surveyed the addendum survey area while utilizing the methodologies described in the *Initial Report*.

The field survey results presented herein apply to the existing and reasonably foreseeable site conditions observed at the time of our assessment. They cannot apply to site changes of which URS 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 URS which occur after the presentation of this report document.

RESULTS

During the ecological assessment, URS did not identify any wetlands, streams, or ponds within the addendum survey area. The approximately 16-acre addendum survey area was observed as an upland ridge that primarily consisted of steep slopes with an oak-hickory canopy and moderate to heavy undergrowth. Portions of the addendum survey area appeared to have been historically modified through tree removal, cut/fill material, and landslides. The following paragraphs discuss the results of the wetland delineation and stream assessment within the addendum survey area.

Preliminary Soils Evaluation

According to the online Web Soil Survey for Larwence County, Kentucky (USDA, 2015) and the NRCS Hydric Soils List of Kentucky, two soil series are mapped within addendum survey area. Four soil map units were mapped within the addendum survey area and all were listed as not hydric (USDA, 2015). Soil map units located within the addendum survey boundary are shown on Figure 2 in Attachment A.

National Wetland Inventory (NWI) Map Review

NWI wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation 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/or 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 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 maps of the Fallsburg and Prichard, Kentucky quadrangles, the addendum survey boundary does not contain any mapped NWI wetlands. Within the surrounding area of the addendum survey boundary, three NWI wetlands were mapped: one Palustrine Emergent Persistent Semi-permanently Flooded Diked/Impounded wetland (PEM1Fh), one Lacustrine Limnetic Unconsolidated Bottom Permanently Flooded Diked/Impounded (L1UBHh) feature, and one Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded (PUBHh) wetland (USFWS, 2014). The locations of the surrounding area NWI mapped wetlands are presented in Figure 2 and were previously noted in the Initial Report.

Wetlands

During the delineation, no wetlands were identified by URS within the addendum survey area.

Streams

During the delineation, no steams were identified by URS within the addendum survey area.

CONCLUSION

URS conducted a wetland delineation and stream assessment of the approximately 16-acre addendum survey area for the Big Sandy Fly Ash Pond Closure Project, in Lawrence County, Kentucky on June 7, 2012 (Figure 1).

During the ecological assessment, URS did not identify any wetlands, streams, or ponds within the addendum survey area as shown in Figure 3. The approximately 16-acre addendum survey area was observed as an upland ridge that primarily consisted of steep slopes with an oak-hickory canopy and moderate to heavy undergrowth. Portions of the addendum survey area appeared to have been historically modified through tree removal, cut/fill material, and landslides.

— ooOoo —

URS appreciates the opportunity to provide AEP with this addendum to the wetland delineation and stream assessment to assist with the Big Sandy Fly Ash Pond Closure Project. Please do not hesitate to contact URS if there are any questions or comments regarding this report.

Sincerely,

URS Corporation

Ben Otto

Matthew Thomayer

Benjamin Otto
Senior Ecologist
Benjamin.otto@urs.com

Matt Thomayer
Senior Ecologist/Project Manager
Matt.thomayer@urs.com

References

U.S. Department of Agriculture, Natural Resources Conservation Service. 2014. Web Soil Survey (GIS Shapefile). http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm Accessed 01/16/15

U.S. Fish and Wildlife Service. 2014. National Wetlands Inventory Branch of Resource and Mapping Service. http://www.fws.gov/wetlands/FAQs.html Accessed 01/05/15

Attachments

Attachment A: Figures 1 through 3

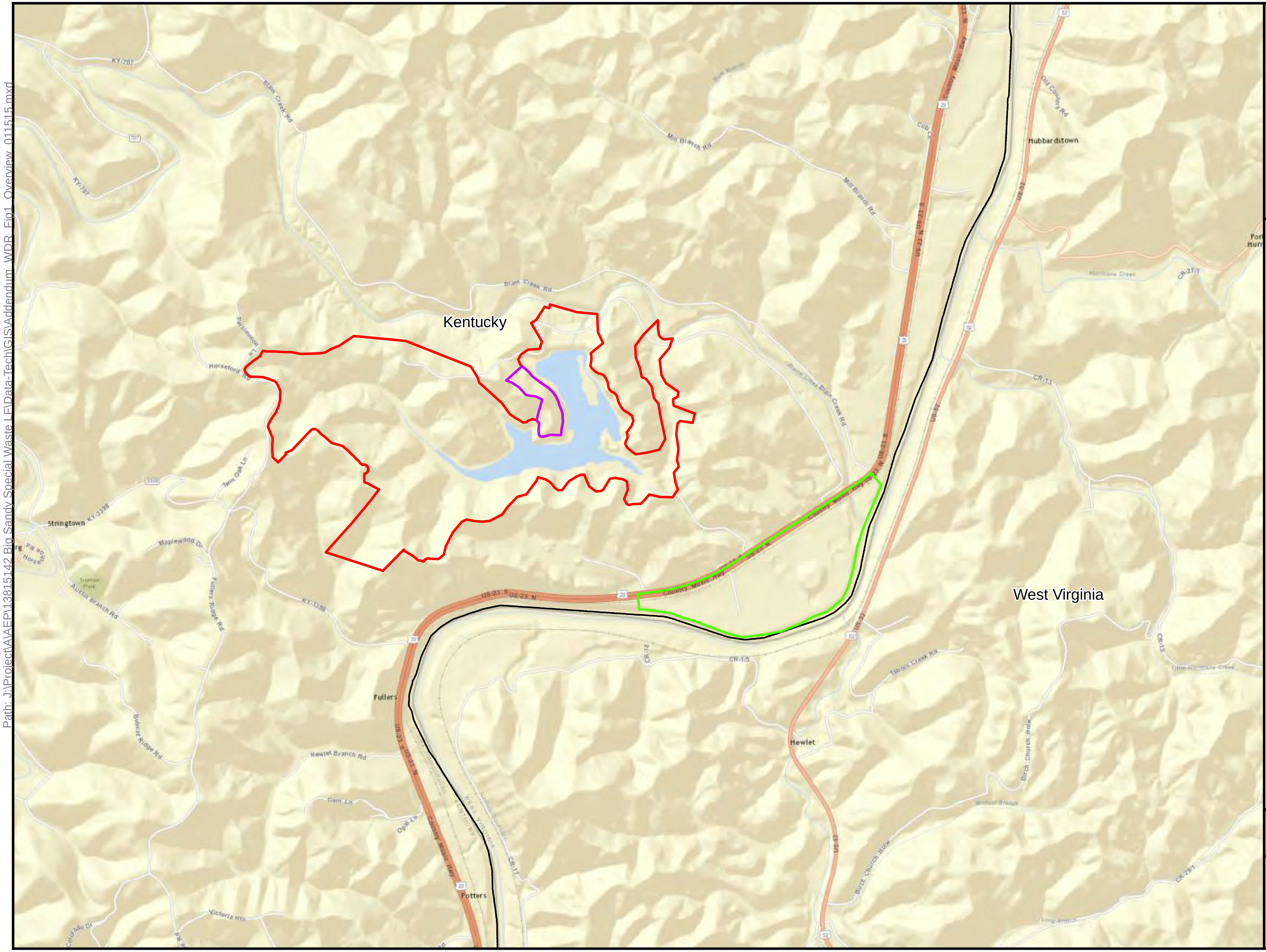
Figure 1: Overview Map

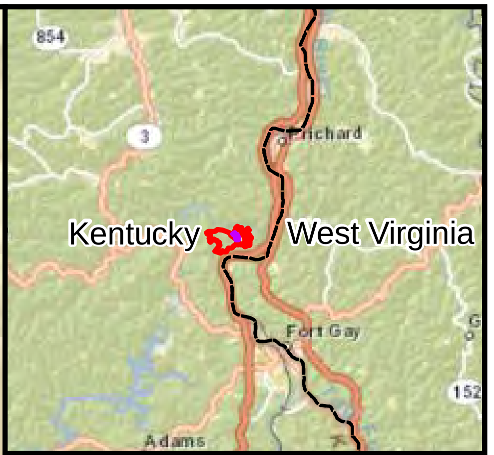
Figure 2: Soils and National Wetland Inventory Map

Figure 3: Wetland Delineation and Stream Assessment Map

ATTACHMENT A

FIGURES





N

LEGEND

🟪	Addendum Survey Boundary
🟥	Previous 2012 Survey Boundary
—	Big Sandy Plant Boundary
▭	State

0 2,000 4,000

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online
World Street Map

AEP

Big Sandy Fly Ash Pond Closure

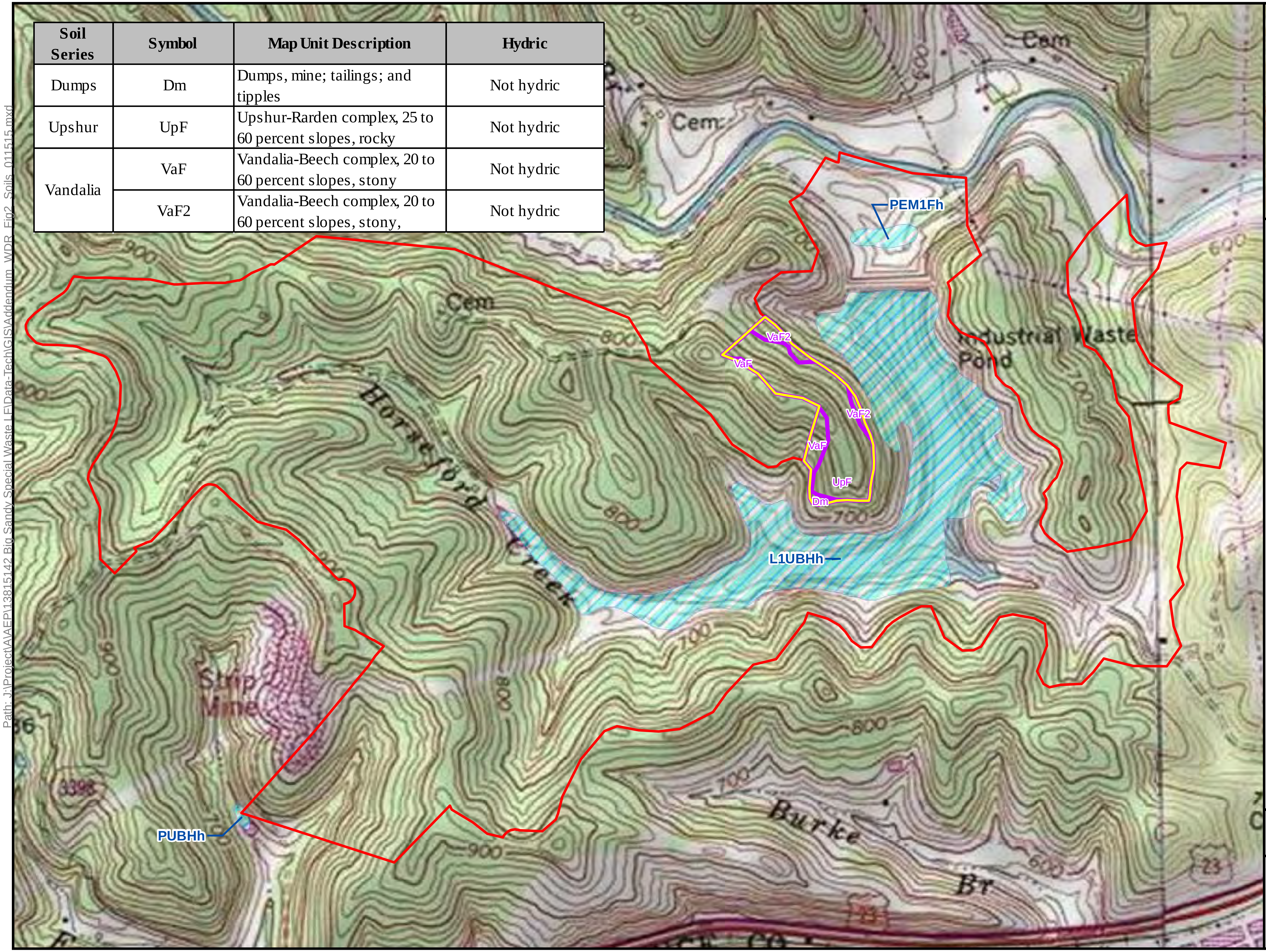
FIGURE 1
OVERVIEW MAP

JOB NO. 13815142

URS

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\Addendum_WDR_Fig1_Overview_011515.mxd

Soil Series	Symbol	Map Unit Description	Hydric
Dumps	Dm	Dumps, mine; tailings; and tipples	Not hydric
Upshur	UpF	Upshur-Rarden complex, 25 to 60 percent slopes, rocky	Not hydric
Vandalia	VaF	Vandalia-Beech complex, 20 to 60 percent slopes, stony	Not hydric
	VaF2	Vandalia-Beech complex, 20 to 60 percent slopes, stony,	Not hydric



LEGEND

- 🟨 Addendum Survey Boundary
- 🟥 Previous 2012 Survey Boundary
- ▨ NWI Wetland
- 🟪 Soil Map Unit

0 500 1,000

Scale in Feet

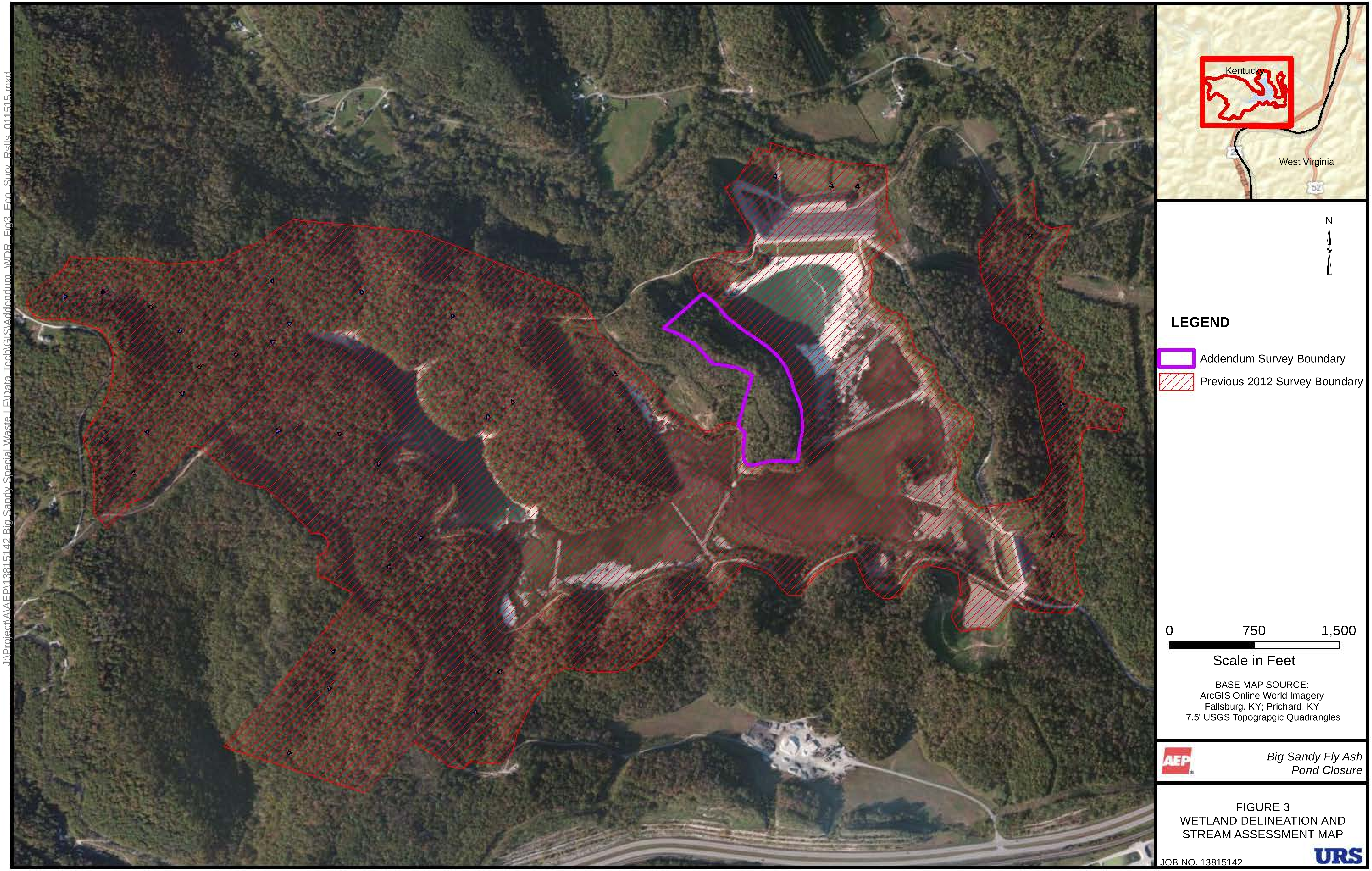
BASE MAP SOURCE:
ArcGIS Online
USA Topo Maps
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

Big Sandy Fly Ash Pond Closure

FIGURE 2
NATIONAL WETLAND INVENTORY
AND SOIL MAP UNITS MAP

JOB NO. 13815142

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\Addendum_WDR_Fig2_Soils_011515.mxd



LEGEND

▭ Addendum Survey Boundary

▨ Previous 2012 Survey Boundary

0 750 1,500

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online World Imagery
Fallsburg. KY; Prichard, KY
7.5' USGS Topograpgic Quadrangles

AEP

Big Sandy Fly Ash
Pond Closure

FIGURE 3
WETLAND DELINEATION AND
STREAM ASSESSMENT MAP

JOB NO. 13815142

URS

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DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX: (502) 315-6677
http://www.lrl.usace.army.mil/

SEP 29 2014

September 18, 2014

Operations Division
Regulatory Branch (South)
ID No. LRL-2014-417-mdh

Ms. Jill Lukehart
American Electric Power
1 Riverside Plaza
Columbus, OH 43215

Dear Ms. Lukehart:

This is in response to your request for an approved jurisdictional determination. The request was made for a 602-acre parcel, including a fly ash disposal pond associated with the Big Sandy Power Plant and adjacent lands, located near the City of Louisa in Lawrence County, Kentucky.

The U.S. Army Corps of Engineers exercises regulatory authority under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403) and Section 404 of the Clean Water Act (33 U.S.C. § 1344) for certain activities in "waters of the United States (U.S.)." These waters include all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce.

Based on a review of the submitted information, we have verified that the one-hundred and fifty-three (153) identified tributaries (see *Table 1*), possess a significant nexus and as such are considered jurisdictional "waters of the U.S." In addition, the report identified twelve (12) wetlands and one (1) open water (see *Table 1*), which either abut or lie adjacent to one of the aforementioned tributaries. These stream channels, adjacent/abutting wetlands and open water perform numerous functions which have a substantial, or more than speculative, effect on the Big Sandy River (a traditional navigable waters).

Therefore, if construction activities would require discharges of dredged or fill material within the delineated boundaries of the twelve (12) wetlands and/or below the Ordinary High Water Mark (OHWM) of the one (1) open water or the one-hundred and fifty-three (153) stream channels (i.e., any of the *Table 1* waters), then a Department of the Army (DA) permit would be required.

In addition to these waters, the report identified four (4) isolated wetlands, which lack a significant nexus (see *Table 2*). These waters do not appear to be used or be susceptible to use in interstate or foreign commerce. As such, these waters are not considered to be "waters of the U.S."

Further, the 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water (KPDES Permit# KY0000221). Per 33 C.F.R. § 328.3(a)(8) of our regulations, such waters are not considered to be jurisdictional "waters of the U.S." Also, since Wetland 8 lies within the Fly Ash

Pond's maximum operating pool elevation, it is also not considered jurisdictional per 33 C.F.R. § 328.3(a)(8).

Therefore, a DA permit is not required for proposed impacts to these waters (see *Table 2*). However, this determination does not relieve you of the responsibility to comply with applicable State law. We urge you to contact the Kentucky Energy & Environment Cabinet Division of Water, 200 Fair Oaks, 4th Floor Frankfort, Kentucky 40601, to determine the applicability of State law to your project.

This letter contains an approved jurisdictional determination for the 602-acre subject parcel and is valid for a period of five (5) years from the date of this letter unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 C.F.R. § 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination, you must submit a completed RFA form to the Lakes and Rivers Division Office at the following address.

Appeals Review Officer
Great Lakes and Ohio River Division
CELRD-PD-REG
550 Main Street, Room 10032
Cincinnati, OH 45202-3222
(513) 684-6212

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. § 331.5, and that it has been received by the Division Office within **60 days** of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **November 17, 2014**. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

If we can be of any further assistance, please contact us by writing to the above address, ATTN: CELRL-OP-FS, or call me at (502) 315-6676. Any correspondence on this matter should refer to our ID Number LRL-2014-417-mdh.

Sincerely,

Michael Hasty
Senior Project Manager, South Section
Regulatory Branch

Enclosures

Copy Furnished:

Mr. James Bicknell
Kentucky Energy & Environment Cabinet
Division of Water
200 Fair Oaks, 4th Floor
Frankfort, KY 40601

Mr. Matt Thomayer
URS Corporation
525 Vine Street, Suite 1800
Cincinnati, OH 45202

Table 1: (Jurisdictional Stream Channels, Wetlands & Open Water):

ID #	Description/Tribuary Name	Latitude	Longitude	Size (acres= ac) (lf =linear feet)
Wetland 01	Emergent/Scrub-Shrub Wetland	38.185144	-82.65042	0.06 ac
Wetland 02	Emergent Wetland	38.184948	-82.650542	0.03 ac
Wetland 06	Emergent/Scrub-Shrub Wetland	38.185745	-82.637086	0.03 ac
Wetland 09	Emergent/Scrub-Shrub Wetland	38.185936	-82.635573	0.06 ac
Wetland 10	Emergent Wetland	38.187993	-82.633528	0.02 ac
Wetland 11	Emergent Wetland	38.187827	-82.632687	0.05 ac
Wetland 12	Emergent Wetland	38.188183	-82.631769	0.02 ac
Wetland 13	Emergent Wetland	38.187824	-82.631001	0.03 ac
Wetland 15	Emergent Wetland	38.179389	-82.625917	0.06 ac
Wetland 14	Emergent/Scrub-Shrub Wetland	38.179076	-82.625342	0.21 ac
Wetland 16	Emergent/Scrub-Shrub Wetland	38.179511	-82.624825	0.08 ac
Wetland 17	Forested Wetland	38.185963	-82.625944	0.55 ac
Pond 01	Pond	38.177116	-82.641885	0.24 ac
Stream 68	Unnamed Perennial (RPW) Tributary of Fuller's Branch	38.176515	-82.647681	1,381 lf
Stream 30	Unnamed Perennial (RPW) Tributary of Blaine Creek	38.188125	-82.633499	558 lf
Stream 44	Horseford Creek-Perennial (RPW) Tributray of Blaine Creek	38.18353	-82.65165	2,379 lf
Stream 58	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174032	-82.647949	604 lf
Stream 59	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174786	-82.646863	881 lf
Stream 59a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174412	-82.646894	304 lf
Stream 60	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176137	-82.646625	692 lf
Stream 60a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175762	-82.647063	149 lf
Stream 68a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174678	-82.648721	92 lf
Stream 68b	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17473	-82.648255	62 lf
Stream 68c	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17447	-82.648223	224 lf
Stream 68d	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175023	-82.647836	158 lf
Stream 68e	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174797	-82.648466	69 lf
Stream 68f	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175329	-82.647784	68 lf
Stream 68g	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174959	-82.648427	130 lf
Stream 68h	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17541	-82.647479	200 lf
Stream 68i	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17517	-82.648242	104 lf
Stream 68j	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175685	-82.647456	102 lf
Stream 68k	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175554	-82.647476	139 lf
Stream 68l	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177244	-82.647641	65 lf
Stream 68m	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177145	-82.647626	85 lf
Stream 68n	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177322	-82.647374	204 lf
Stream 68o	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176957	-82.647088	256 lf
Stream 68p	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.1764	-82.647351	58 lf
Stream 68q	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176428	-82.646887	251 lf
Stream 68r	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176653	-82.647099	266 lf
Stream 05	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179566	-82.625246	70 lf
Stream 26	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179403	-82.624443	178 lf
Stream 27	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179562	-82.624478	154 lf
Stream 28	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18034	-82.624501	185 lf
Stream 29	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.180985	-82.624289	138 lf
Stream 72	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.181433	-82.624959	175 lf
Stream 73	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182305	-82.625104	210 lf
Stream 74	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184755	-82.626268	336 lf
Stream 75	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185768	-82.626399	108 lf
Stream 76	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186226	-82.626544	385 lf
Stream 77	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185364	-82.625733	36 lf
Stream 78	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183861	-82.624616	354 lf
Stream 78a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183771	-82.624265	120 lf
Stream 78b	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183921	-82.62445	61 lf
Stream 78c	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184067	-82.624865	96 lf
Stream 79	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182304	-82.623863	542 lf
Stream 79a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182473	-82.623487	391 lf
Stream 79aa	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182373	-82.622941	53 lf
Stream 80	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186308	-82.626727	132 lf

Table 1: (Jurisdictional Stream Channels, Wetlands & Open Water):

ID #	Description/Tribuary Name	Latitude	Longitude	Size (acres= ac) (lf =linear feet)
Stream 80a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18624	-82.62678	80 lf
Stream 01	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18278	-82.642085	402 lf
Stream 01a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18292	-82.642209	176 lf
Stream 02	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182358	-82.641507	411 lf
Stream 02a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182345	-82.641158	157 lf
Stream 03	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182731	-82.642327	313 lf
Stream 06	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180497	-82.640554	170 lf
Stream 07	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18074	-82.64076	278 lf
Stream 08	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182257	-82.642054	101 lf
Stream 09	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182792	-82.64174	479 lf
Stream 09a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182594	-82.641687	119 lf
Stream 09b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182694	-82.64161	194 lf
Stream 10	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183665	-82.644132	95 lf
Stream 11a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18441	-82.643544	117 lf
Stream 11b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184944	-82.643781	104 lf
Stream 11c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184638	-82.64308	381 lf
Stream 11d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184545	-82.64252	129 lf
Stream 11e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184364	-82.644005	62 lf
Stream 12	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184279	-82.644254	95 lf
Stream 13a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185804	-82.648927	56 lf
Stream 13b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186405	-82.648953	306 lf
Stream 13c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186111	-82.649453	185 lf
Stream 14	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177507	-82.639347	183 lf
Stream 15a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176481	-82.642261	47 lf
Stream 15b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176163	-82.642182	104 lf
Stream 15c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176046	-82.642318	173 lf
Stream 15d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175778	-82.642329	245 lf
Stream 15e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175752	-82.642651	61 lf
Stream 15f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175687	-82.643729	646 lf
Stream 15g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175682	-82.643372	275 lf
Stream 16	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17767	-82.642599	132 lf
Stream 17a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179664	-82.644962	111 lf
Stream 17b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179373	-82.645296	112 lf
Stream 17c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178786	-82.646264	233 lf
Stream 18a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182426	-82.64647	93 lf
Stream 18b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182388	-82.646877	100 lf
Stream 18c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182425	-82.647548	113 lf
Stream 18d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182362	-82.647975	87 lf
Stream 18e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82.648736	43 lf
Stream 18f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182427	-82.64916	114 lf
Stream 18g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182275	-82.649426	69 lf
Stream 19	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183625	-82.646425	182 lf
Stream 20	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184248	-82.649346	740 lf
Stream 20a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184416	-82.648381	81 lf
Stream 20b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183988	-82.649448	138 lf
Stream 20c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183736	-82.64961	294 lf
Stream 21	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183258	-82.637508	84 lf
Stream 23	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183783	-82.638926	165 lf
Stream 23a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183776	-82.63877	77 lf
Stream 24	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181997	-82.635548	177 lf
Stream 25	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182203	-82.63839	415 lf
Stream 33	Unnamed Ephemeral (Non-RPW)Tributary to fly ash pond	38.183828	-82.6441	64 lf
Stream 34	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184202	-82.643787	141 lf
Stream 34a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184134	-82.643645	100 lf

Table 1: (Jurisdictional Stream Channels, Wetlands & Open Water):

ID #	Description/Tribuary Name	Latitude	Longitude	Size (acres= ac) (lf =linear feet)
Stream 35a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185921	-82.645834	211 lf
Stream 35b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185204	-82.6465	78 lf
Stream 36	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177545	-82.638531	280 lf
Stream 37	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176969	-82.642526	171 lf
Stream 38	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17922	-82.644498	279 lf
Stream 40	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1813	-82.645778	157 lf
Stream 41a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18117	-82.646067	56 lf
Stream 42	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182146	-82.648394	114 lf
Stream 43	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184011	-82.647594	368 lf
Stream 44a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18488	-82.650217	554 lf
Stream 44b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182484	-82.653843	633 lf
Stream 44c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181227	-82.653997	232 lf
Stream 45	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183078	-82.637348	93 lf
Stream 47	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82.635048	48 lf
Stream 48	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183095	-82.638419	73 lf
Stream 49	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181963	-82.637701	109 lf
Stream 50	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185788	-82.635826	116 lf
Stream 51	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185756	-82.635877	75 lf
Stream 52	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181211	-82.628042	47 lf
Stream 53	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182467	-82.627866	64 lf
Stream 54	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182315	-82.627723	39 lf
Stream 55	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184567	-82.629622	88 lf
Stream 56	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178126	-82.633154	36 lf
Stream 57	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178022	-82.630229	43 lf
Stream 61	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180213	-82.627552	31 lf
Stream 62	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182122	-82.627641	70 lf
Stream 63	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182254	-82.627658	77 lf
Stream 64	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184825	-82.629898	77 lf
Stream 65	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185999	-82.630599	19 lf
Stream 66	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186103	-82.630655	30 lf
Stream 67	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178037	-82.63036	51 lf
Stream 70a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183487	-82.651216	75 lf
Stream 70b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183499	-82.650664	310 lf
Stream 71a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185856	-82.652998	262 lf
Stream 71b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18583	-82.653492	131 lf
Stream 71c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186375	-82.654015	548 lf
Stream 71d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1858	-82.654716	440 lf
Stream 71e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185899	-82.655866	81 lf
Stream 71f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185596	-82.655933	222 lf
Stream 04	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.179875	-82.625015	3,343 lf
Stream 11	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.184825	-82.643639	491 lf
Stream 13	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.185593	-82.648905	816 lf
Stream 15	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.17573	-82.642819	895 lf
Stream 17	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.179089	-82.645326	797 lf
Stream 18	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.18225	-82.648104	1,120 lf
Stream 22	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.183653	-82.63824	186 lf
Stream 35	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.185591	-82.646285	561 lf
Stream 39	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.181365	-82.645372	169 lf
Stream 41	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.181378	-82.645992	652 lf
Stream 46	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.18363	-82.638883	432 lf
Stream 70	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.183888	-82.650984	442 lf
Stream 71	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.185572	-82.653279	1,816 lf
Stream 31	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.188061	-82.630791	371 lf
Stream 32	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.188102	-82.631772	315 lf

Table 2 (Non-jurisdictional waters):				
ID #	**Description**	**Latitude**	**Longitude**	**Size (acres)**
Wetland 03	Isolated Emergent Wetland	38.184148	-82.64005	0.08
Wetland 04	Isolated Emergent Wetland	38.184414	-82.640347	0.14
Wetland 05	Isolated Emergent Wetland	38.18358	-82.639877	0.11
Wetland 07	Isolated Emergent Wetland	38.182916	-82.638806	0.07
Wetland 08	Emergent Wetland	38.18342	-82.638723	0.04
Fly Ash Pond	Fly Ash Pond	38.182151	-82.630658	130

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Isolated Wetlands W-3, W-4, W-5 and W-7

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38°-10'-49.441"N, Long 82°-38'-16.344"W.
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☑ Field Determination. Date: August 12, 2014

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs

☐ Non-RPWs that flow directly or indirectly into TNWs

☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

☐ Impoundments of jurisdictional waters

☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: linear feet: width (ft) and/or acres.
Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual
Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☑ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: The four isolated wetlands, referred to as Wetlands 03, 04, 05, and 07, are physically isolated, do not lie within the 100-year floodplain, lack a hydrological connection and are not adjacent to other "waters of the U.S." and do not have any shallow subsurface flow to other waters. The wetlands are not used nor are they susceptible to use in interstate or foreign commerce. Thus, the wetlands are not considered to be "waters of the U.S."

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**

Identify TNW:

Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) General Area Conditions:

Watershed size:
Drainage area:

Average annual rainfall:
Average annual snowfall:

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☐ Tributary flows through tributary before entering TNW.

Project waters are river miles from TNW.
Project waters are river miles from RPW.
Project waters are aerial (straight) miles from TNW.
Project waters are aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW[5]:
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural

☐ Artificial (man-made). Explain:

☐ Manipulated (man-altered). Explain:

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width:
Average depth:
Average side slopes:

Primary tributary substrate composition (check all that apply):

☐ Silts
☐ Cobbles
☐ Bedrock
☐ Other. Explain: detritus
☐ Sands
☐ Gravel
☐ Vegetation. Type/% cover:
☐ Concrete
☐ Muck

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry:
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for:
Estimate average number of flow events in review area/year:
Describe flow regime:
Other information on duration and volume:

Surface flow is: Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
  ☐ clear, natural line impressed on the bank
  ☐ changes in the character of soil
  ☐ shelving
  ☐ vegetation matted down, bent, or absent
  ☐ leaf litter disturbed or washed away
  ☐ sediment deposition
  ☐ water staining
  ☐ other (list):
  ☐ the presence of litter and debris
  ☐ destruction of terrestrial vegetation
  ☐ the presence of wrack line
  ☐ sediment sorting
  ☐ scour
  ☐ multiple observed or predicted flow events
  ☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
  ☐ oil or scum line along shore objects
  ☐ fine shell or debris deposits (foreshore)
  ☐ physical markings/characteristics
  ☐ tidal gauges
  ☐ other (list):
☐ Mean High Water Mark indicated by:
  ☐ survey to available datum;
  ☐ physical markings;
  ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:
Identify specific pollutants, if known:

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width):

☐ Wetland fringe. Characteristics:

☐ Habitat for:

  ☐ Federally Listed species. Explain findings:

  ☐ Fish/spawn areas. Explain findings:

  ☐ Other environmentally-sensitive species. Explain findings:

  ☐ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain:
Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Explain:

Surface flow is:
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☐ Not directly abutting

  ☐ Discrete wetland hydrologic connection. Explain:

  ☐ Ecological connection. Explain:

  ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are river miles from TNW.
Project waters are aerial (straight) miles from TNW.
Flow is from:
Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics, etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width):

☐ Vegetation type/percent cover. Explain:

☐ Habitat for:

  ☐ Federally Listed species. Explain findings:

  ☐ Fish/spawn areas. Explain findings:

  ☐ Other environmentally-sensitive species. Explain findings:

  ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis:
Approximately (#) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g., between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters:
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters:

3. Non-RPWs[8] that flow directly or indirectly into TNWs.

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters:

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area:

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

7. Impoundments of jurisdictional waters.[9]

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☑ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

  ☑ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☑ Wetlands: Four wetlands totaling 0.40 acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands:

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☑ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☑ U.S. Geological Survey Hydrologic Atlas:
  - ☑ USGS NHD data.
  - ☑ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
- ☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle
- ☐ State/Local wetland inventory map(s):
- ☑ FEMA/FIRM maps: 21127C0120D
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☑ Photographs: ☐ Aerial (Name & Date):
- ☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Applicable/supporting case law:
- ☐ Applicable/supporting scientific literature:
- ☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The four (4) wetlands have no substantial nexus to a water of the U.S as they are physically isolated, do not lie within the 100-year floodplain and lack a hydrological connection to other waters of the United States. The wetlands are also not used nor are they susceptible to use in interstate or foreign commerce. Therefore, the wetlands are not considered to be "waters of the U.S.".

POTENIAL ISOLATED WETLANDS WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description	Latitude	Longitude	Size (acre)	HUC	Quad
Wetland 03	Isolated Emergent Wetland	38.184148	-82.64005	0.08	Big Sandy	Fallsburg
Wetland 04	Isolated Emergent Wetland	38.184414	-82.640347	0.14	Big Sandy	Fallsburg
Wetland 05	Isolated Emergent Wetland	38.18358	-82.639877	0.11	Big Sandy	Fallsburg
Wetland 07	Isolated Emergent Wetland	38.182916	-82.638806	0.07	Big Sandy	Fallsburg
Total: 4				**0.40**		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38°-10'-49.441"N, Long 82°-38'-16.344"W.
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: July 24, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☑ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs

☐ Non-RPWs that flow directly or indirectly into TNWs

☑ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

☑ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

☐ Impoundments of jurisdictional waters

☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: Two (2) intermittent stream channels totaling 686 linear feet: 5 width (ft).
Wetlands: Three (3) emergent wetlands totaling 0.10 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW:
Summarize rationale supporting determination:

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: Big Sandy Watershed: 410.4 square miles.
Drainage area:

Average annual rainfall: 50 inches
Average annual snowfall: 21 inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☑ Tributary flows through 1 tributary before entering TNW.

Project waters are 1-2 river miles from TNW.
Project waters are NA river miles from RPW.
Project waters are 1-2 aerial (straight) miles from TNW.
Project waters are NA aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW[5]: Streams 31 and 32 both flow into Blaine Creek (a perennial RPW). Blaine Creek flows into the Big Sandy River (a TNW).
Tributary stream order, if known: Second & Third, respectively.

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☑ Artificial (man-made) Explain: Streams originate at dam outfall of fly ash wastewater treatment pond.
☑ Manipulated (man-altered). Explain: Streams contain culverts, riprap, level spreaders

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width: 5 feet
Average depth: 3-18 inches
Average side slopes: 3:1

Primary tributary substrate composition (check all that apply):

☑ Silts
☑ Cobbles
☐ Bedrock
☐ Sands
☑ Gravel
☐ Vegetation. Type/% cover:
☐ Concrete
☐ Muck
☑ Other. Explain: detritus, boulder, riprap

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Fairly stable, vegetated.
Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes were observed in both streams.
Tributary geometry: Relatively Straight
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: Seasonal Flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Intermittent

Other information on duration and volume: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there is an average of approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area.

Surface flow is: Discrete and Confined Characteristics:

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☑ Bed and banks
☑ OHWM[6] (check all indicators that apply):
- ☑ clear, natural line impressed on the bank
- ☐ changes in the character of soil
- ☐ shelving
- ☐ vegetation matted down, bent, or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other (list):
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☑ multiple observed or predicted flow events
- ☐ abrupt change in plant community

☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:
- ☐ oil or scum line along shore objects
- ☐ fine shell or debris deposits (foreshore)
- ☐ physical markings/characteristics
- ☐ tidal gauges
- ☐ other (list):

☐ Mean High Water Mark indicated by:
- ☐ survey to available datum;
- ☐ physical markings;
- ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Water color in Stream 31 appeared to be clear and originates from the fly ash wastewater treatment pond. Water was not observed in Stream 32.

Identify specific pollutants, if known:

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☑ Riparian corridor. Characteristics (type, average width): 6-12 meters

☑ Wetland fringe. Characteristics: Wetland 12 abuts Stream 32. Wetland 13 abuts Stream 31.

☑ Habitat for:

- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☑ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: 0.10 acres
Wetland type. Explain: Emergent
Wetland quality. Explain: Low, ORAM Category 1
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Intermittent Flow Explain:

Surface flow is: Overland Sheetflow
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- ☑ Directly abutting
- ☑ Not directly abutting
  - ☑ Discrete wetland hydrologic connection. Explain: Wetland 11 is located in close proximity to Stream 32 (<60 ft.) and is within the 100-year floodplain.
  - ☑ Ecological connection. Explain: Wetland 11 is located in close proximity to Stream 32 (<60 ft.) and provides ecological functions such as stormwater attenuation, filtering and wildlife habitat.
  - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are 1-2 river miles from TNW.
Project waters are 1-2 aerial (straight) miles from TNW.
Flow is from: Wetland to Navigable Waters
Estimate approximate location of wetland as within the within 100-year floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☑ Riparian buffer. Characteristics (type, average width): The wetlands provide buffers <30'.

☑ Vegetation type/percent cover. Explain: herbaceous 100%

☑ Habitat for:

- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☑ Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 3
Approximately (0.10) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
Wetland-11 N	0.05		
Wetland-12 Y	0.02		
Wetland-13 Y	0.03		

Summarize overall biological, chemical and physical functions being performed: Wetlands 11, 12, and 13 function as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. The wetlands also have the capacity to transfer nutrients and organic carbon to support downstream food-webs.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g., between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Based on the aforementioned findings, the three (3) emergent wetlands, totaling 0.10 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to the two (2) identified unnamed intermittent (RPW) tributaries (Streams 31 and 32). These intermittent tributaries function as headwater stream channels providing water, nitrogen and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial, or more than speculative, effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

   ☐ TNWs: linear feet width (ft), Or, acres.

   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:

   ☑ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there is an average of approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceeds three months.

   Provide estimates for jurisdictional waters in the review area (check all that apply):

☑ Tributary waters: Two (2) intermittent stream channels totaling 686 linear feet.

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters:

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

☑ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☑ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetland 12 is physically proximate to Stream 32. Wetland 13 is physically proximate to Stream 31.

Provide acreage estimates for jurisdictional wetlands in the review area: Two wetlands (Wetland 12 and Wetland 13) totaling 0.05 acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

☑ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: One wetland (Wetland 11) totaling 0.05 acres is adjacent to Stream 32.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

7. **Impoundments of jurisdictional waters.[9]**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

Identify type(s) of waters:

☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

- ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

- ☑ Office concurs with data sheets/delineation report.
- ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

- ☑ USGS NHD data.
- ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.

☐ Previous determination(s). File no. and date of response letter:

☑ Applicable/supporting case law: *U.S. v. Cundiff*, 555 F.3d 200 (6th Cir. 2009).

☑ Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)

Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales.
Journal of the American Water Resources Association 43 (1), 5-14.
doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007)
The role of headwater streams in downstream water quality.
Journal of the American Water Resources Association 43 (1), 41-59.
doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007)
Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.
Journal of the American Water Resources Association 43 (1), 72-85.
doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007)
The contribution of headwater stream to biodiversity in river networks
Journal of the American Water Resources Association 43 (1), 86-103.
doi:10.1111/j.1752-1688.2007.00008.x

☑ Other information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013)

B. ADDITIONAL COMMENTS TO SUPPORT JD: The three (3) wetlands, totaling 0.10 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to two unnamed intermittent (RPW) tributaries of Blaine Creek (Streams 31 and 32). Blaine Creek flows into the Big Sandy River (a TNW). The two intermittent stream channels function as headwater tributaries.

INTERMITTENT STREAMS AND WETLANDS DRAINING TO BLAINE CREEK BELOW HORSEFORD CREEK DAM WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet or acres)	HUC	Quad
Stream 31	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.188061	-82.630791	371	Big Sandy	Fallsburg
Stream 32	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.188102	-82.631772	315	Big Sandy	Fallsburg
Wetland 11	PEM Wetland	38.187827	-82.632687	0.05	Big Sandy	Fallsburg
Wetland 12	PEM Wetland	38.188183	-82.631769	0.02	Big Sandy	Fallsburg
Wetland 13	PEM Wetland	38.187824	-82.631001	0.03	Big Sandy	Fallsburg
Total: 2 streams, 3 wetlands				**Streams: 686 linear feet; Wetlands: 0.10 acre**		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Fly Ash Pond and Wetland 8

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.182151 N, Long -82.630658 W.
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: August 1, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
☐ Non-RPWs that flow directly or indirectly into TNWs
☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: linear feet: width (ft) and/or acres.
Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☑ The 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water. Per 33 C.F.R. § 328.3(a)(8) of our regulations, such waters are not considered to be jurisdictional "waters of the United States." In addition, one (1) emergent wetland (Wetland 08) totaling 0.04 acre is located within the limits of the maximum operating pool elevation (e.g., 705 feet) for the fly ash waste water treatment pond. Since the wetland falls within the permitted limits of this water, it is also not considered to be a jurisdictional water of the United States per 33 C.F.R. § 328.3(a)(8).

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**

Identify TNW:

Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) **General Area Conditions:**
Watershed size:
Drainage area:

Average annual rainfall:
Average annual snowfall:

(ii) **Physical Characteristics:**

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☐ Tributary flows through tributary before entering TNW.

Project waters are river miles from TNW.
Project waters are river miles from RPW.
Project waters are aerial (straight) miles from TNW.
Project waters are aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW[5]:
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural

☐ Artificial (man-made). Explain:

☐ Manipulated (man-altered). Explain:

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width:
Average depth:
Average side slopes:

Primary tributary substrate composition (check all that apply):

☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: detritus

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry:
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for:
Estimate average number of flow events in review area/year:
Describe flow regime:
Other information on duration and volume:

Surface flow is: Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:
Identify specific pollutants, if known:

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width):
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☐ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain:
Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Explain:

Surface flow is:
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain:
  - ☐ Ecological connection. Explain:
  - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are river miles from TNW.
Project waters are aerial (straight) miles from TNW.
Flow is from:
Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis:
Approximately (#) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters:
   - ☐ Other non-wetland waters: acres.

     Identify type(s) of waters:

3. Non-RPWs[8] that flow directly or indirectly into TNWs.

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters:

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area:

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

7. Impoundments of jurisdictional waters.[9]

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☑ Other: (explain, if not covered above): The 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water. Per 33 C.F.R. § 328.3(a)(8), such waters are not considered to be considered jurisdictional "waters of the United States." In addition, one (1) emergent wetland (Wetland 08) totaling 0.04 acre is located within the limits of the maximum operating pool elevation (e.g., 705 feet) for the fly ash waste water treatment pond. Since the wetland falls within the permitted limits of this water, it is also not considered to be a jurisdictional water of the United States per 33 C.F.R. § 328.3(a)(8).

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands: Four wetlands totaling .

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands:

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal

☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

☑ USGS NHD data.

☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water. Per 33 C.F.R. § 328.3(a)(8), such waters are not considered to be considered jurisdictional "waters of the United States." In addition, one (1) emergent wetland (Wetland 08) totaling 0.04 acre is located within the limits of the maximum operating pool elevation (e.g., 705 feet) for the fly ash waste water treatment pond. Since the wetland falls within the permitted limits of this water, it is also not considered to be a jurisdictional water of the United States per 33 C.F.R. § 328.3(a)(8).

Fly Ash Pond, 130 acres, Lat. 38.182151 N, Long -82.630658 W
W8 (Emergent), 0.04 acres, Lat. 38.18342 N, Lon. -82.638723 W

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-68

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.175615 °, Long. -82.647681 °
Universal Transverse Mercator:
Name of nearest waterbody: Fuller's Branch
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: July 24, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☑ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs

☐ Non-RPWs that flow directly or indirectly into TNWs

☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

☐ Impoundments of jurisdictional waters

☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: One (1) perennial stream channel totaling 1,381 linear feet: 14 width (ft).
Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**

Identify TNW:

Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) General Area Conditions:

Watershed size:
Drainage area: Big Sandy River: 410.4 square miles

Average annual rainfall: 50.0 inches
Average annual snowfall: 21.0 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☑ Tributary flows through 1 tributaries before entering TNW.

Project waters are 1-2 river miles from TNW.
Project waters are NA river miles from RPW.
Project waters are 1 (or less) aerial (straight) miles from TNW.
Project waters are NA aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW[5]: S-68 (Perennial RPW) flows into Fuller's Branch (RPW), which flows into the Big Sandy River (a TNW).

Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☑ Natural

☐ Artificial (man-made). Explain:

☐ Manipulated (man-altered). Explain:

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):

Average width: 14 feet
Average depth: 6 inches
Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☐ Silts
☑ Cobbles
☑ Bedrock
☑ Other. Explain: Boulders
☐ Sands
☑ Gravel
☐ Vegetation. Type/% cover:
☐ Concrete
☐ Muck

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Moderately stable, partially vegetated
Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes present: Riffle 45%, Run: 30%, Pool: 25%
Tributary geometry: Relatively straight
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: Perennial flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Perennial
Other information on duration and volume:

Surface flow is: Confined Characteristics:

Subsurface flow: Unknown Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☑ Bed and banks
☑ OHWM[6] (check all indicators that apply):
  ☑ clear, natural line impressed on the bank
  ☐ changes in the character of soil
  ☐ shelving
  ☐ vegetation matted down, bent, or absent
  ☐ leaf litter disturbed or washed away
  ☐ sediment deposition
  ☐ water staining
  ☐ other (list):
  ☑ the presence of litter and debris
  ☑ destruction of terrestrial vegetation
  ☐ the presence of wrack line
  ☐ sediment sorting
  ☐ scour
  ☑ multiple observed or predicted flow events
  ☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:
  ☐ oil or scum line along shore objects
  ☐ fine shell or debris deposits (foreshore)
  ☐ physical markings/characteristics
  ☐ tidal gauges
  ☐ other (list):
☐ Mean High Water Mark indicated by:
  ☐ survey to available datum;
  ☐ physical markings;
  ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Water color is clear, no odors or oily film detected
Identify specific pollutants, if known:

---

[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☑ Riparian corridor. Characteristics (type, average width): Mixed mesic forest >50'
- ☐ Wetland fringe. Characteristics:
- ☑ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☑ Aquatic/wildlife diversity. Explain findings: These waters and their buffers provide aquatic and terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain:
Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Explain:

Surface flow is:
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain:
  - ☐ Ecological connection. Explain:
  - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are river miles from TNW.
Project waters are aerial (straight) miles from TNW.
Flow is from:
Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)
All wetland(s) being considered in the cumulative analysis:
Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)   Size (in acres)   Directly abuts? (Y/N)   Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

   ☐ TNWs: linear feet width (ft), Or, acres.

   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

   ☑ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Water fills >75% of available area, originates from steep slope.

   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

   Provide estimates for jurisdictional waters in the review area (check all that apply):

   ☑ Tributary waters: one perennial stream totaling 1,381 linear feet; 14 (ft) width.

   ☐ Other non-wetland waters: acres.

   Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain:
- ☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters:
- ☐ Wetlands: acres.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

  ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

  ☐ Office concurs with data sheets/delineation report.

  ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

  ☑ USGS NHD data.

  ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: One (1) perennial stream channel, totaling 1,381 feet, functions as a headwater tributary (RPW). Stream 68 flows to Fuller's Branch (RPW), which flows into the Big Sandy River (a TNW).

PERENNIAL STREAMS DRAINING TO FULLER'S BRANCH WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
Stream 68	Unamed Perennial Tributary of Fuller's Branch	38.175615	-82.647681	1,381	Big Sandy	Fallsburg
Total: 1				1,381 linear feet		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel (S-30) and Abutting Wetland (W-10)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.188125 °, Long. -82.633499 °
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: June 9, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☑ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
☐ Non-RPWs that flow directly or indirectly into TNWs
☑ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: One (1) perennial stream channel totaling 558 linear feet: 8 width (ft).
Wetlands: One (1) PEM wetland totaling 0.02 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
Identify TNW:
Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   Watershed size:
   Drainage area: Big Sandy River: 410.4 square miles

   Average annual rainfall: 50.0 inches
   Average annual snowfall: 21.0 inches

   (ii) **Physical Characteristics:**
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☑ Tributary flows through 1 tributaries before entering TNW.

   Project waters are 2-3 river miles from TNW.
   Project waters are NA river miles from RPW.
   Project waters are 1-2 aerial (straight) miles from TNW.
   Project waters are NA aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: NA

   Identify flow route to TNW[5]: Stream-30 flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW).
   Tributary stream order, if known: 1st

   (b) General Tributary Characteristics (check all that apply):
   Tributary is: ☐ Natural
   ☐ Artificial (man-made). Explain:
   ☑ Manipulated (man-altered). Explain: Flows from dam outfall, rip rap on streambanks, multiple dams and a culvert on stream

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width: 6.5 feet
Average depth: 18 inches
Average side slopes:

Primary tributary substrate composition (check all that apply):

☑ Silts
☑ Cobbles
☐ Bedrock
☑ Other. Explain: Boulders
☑ Sands
☑ Gravel
☐ Vegetation. Type/% cover:
☐ Concrete
☐ Muck

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Banks shored by rip rap, some herbaceous vegetation

Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes present: Riffle 40%, Run: 50%, Pool: 10%
Tributary geometry: Relatively straight
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: Perennial flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Perennial
Other information on duration and volume:

Surface flow is: Confined Characteristics

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
- ☑ Bed and banks
- ☑ OHWM[6] (check all indicators that apply):
  - ☑ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☑ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☑ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ☐ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ☐ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Water is opaque, sludge deposits present
Identify specific pollutants, if known: KPDES-permitted discharge location for fly ash wastewater treatment pond.

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☑ Riparian corridor. Characteristics (type, average width): Herbaceous <20 ft.
- ☐ Wetland fringe. Characteristics: Wetland-10 Emergent wetland abutting stream.
- ☑ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☑ Aquatic/wildlife diversity. Explain findings: These waters and their buffers provide aquatic and terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: 0.02 acres
Wetland type. Explain: Emergent vegetation
Wetland quality. Explain: Low-quality, ORAM Category 1 wetland
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Perennial Flow Explain:

Surface flow is: Confined
Characteristics:

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:
- ☑ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain:
  - ☐ Ecological connection. Explain:
  - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are 2-5 river miles from TNW.
Project waters are 1-2 aerial (straight) miles from TNW.
Flow is from: Wetland to Navigable Waters
Estimate approximate location of wetland is within the 50 - 100-year floodplain.

(ii) Chemical Characteristics:
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Surface water not observed in wetland.
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☑ Riparian buffer. Characteristics (type, average width): Emergent, <20 ft width
- ☑ Vegetation type/percent cover. Explain: Herbaceous/pem type >100% cover.
- ☑ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☑ Aquatic/wildlife diversity. Explain findings: The wetlands and adjacent stream provide terrestrial and aquatic wildlife habitat.

3. Characteristics of all wetlands adjacent to the tributary (if any)
All wetland(s) being considered in the cumulative analysis: 1
Approximately (0.02) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
Wetland-10 Y	0.02		

Summarize overall biological, chemical and physical functions being performed: This wetland performs multiple functions including streambank stability, pollution control through filtering, and a source of wildlife habitat. The wetland has the capacity to transfer nutrients and organic carbon to support downstream foodwebs.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

   ☐ TNWs: linear feet width (ft), Or, acres.

   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

   ☑ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Water fills >75% of available area, originates from fly ash wastewater treatment pond discharge.

   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

   Provide estimates for jurisdictional waters in the review area (check all that apply):

   ☑ Tributary waters: One (1) perennial stream totaling 558 linear feet; 6.5 width (ft).

   ☐ Other non-wetland waters: acres.
   Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

☑ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☑ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Boundaries of Wetland-10 include streambank of Stream-30.

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 0.02 acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
- ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain:
- ☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters:
- ☐ Wetlands: acres.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

  ☑ Office concurs with data sheets/delineation report.

  ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

  ☑ USGS NHD data.

  ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0110D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The one (1) emergent wetland, totaling 0.02 acres, provides flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to an unnamed perennial (RPW) tributary of Blaine Creek. Blaine Creek flows into the Big Sandy River (a TNW). Stream 30 (RPW) is a perennial stream channel, totaling 558 linear feet, that functions as a headwater tributary to Blaine Creek.

PERENNIAL STREAMS AND WETLANDS DRAINING TO BLAINE CREEK WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 30	Unamed tributary to Blaine Creek	38.188125	-82.633499	558	Big Sandy	Fallsburg
Wetland 10	PEM wetland	38.187993	-82.633528	0.02	Big Sandy	Fallsburg
Total: 1 Stream 1 Wetland				**Stream: 558 linear feet Wetland: 0.02 acre**		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-44

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.18355 °, Long. -82.65165 °
Universal Transverse Mercator:
Name of nearest waterbody: Fly Ash wastewater treatment pond
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River via fly ash wastewater treatment pond
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: July 24, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☑ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
☐ Non-RPWs that flow directly or indirectly into TNWs
☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☑ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. **Identify (estimate) size of waters of the U.S. in the review area:**
Non-wetland waters: One (1) perennial stream channel totaling 2,379 linear feet: 12 width (ft).
Wetlands: acres.

c. **Limits (boundaries) of jurisdiction** based on: Established by OHWM

Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**

Identify TNW:

Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) General Area Conditions:

Watershed size:
Drainage area: Big Sandy River: 410.4 square miles

Average annual rainfall: 50.0 inches
Average annual snowfall: 21.0 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☑ Tributary flows through 1 tributaries before entering TNW.

Project waters are 2-5 river miles from TNW.
Project waters are NA river miles from RPW.
Project waters are 1-2 aerial (straight) miles from TNW.
Project waters are NA aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW[5]: Stream-44 (Horseford Creek) flows into the fly ash wastewater treatment pond, which flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW).
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural

☐ Artificial (man-made). Explain:

☑ Manipulated (man-altered). Explain: Stream-44 drains into fly ash wastewater treatment pond.

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width: 6 feet
Average depth: 6 inches
Average side slopes:

Primary tributary substrate composition (check all that apply):

☑ Silts
☑ Cobbles
☑ Bedrock
☑ Other. Explain: Boulders
☑ Sands
☑ Gravel
☐ Vegetation. Type/% cover:
☐ Concrete
☐ Muck

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Moderately stable, partially vegetated
Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes present: Riffle 60%, Run: 30%, Pool: 10%
Tributary geometry: Relatively straight
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: Perennial flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Perennial
Other information on duration and volume:

Surface flow is: Confined Characteristics:

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☑ Bed and banks
☑ OHWM[6] (check all indicators that apply):
  ☑ clear, natural line impressed on the bank
  ☐ changes in the character of soil
  ☐ shelving
  ☐ vegetation matted down, bent, or absent
  ☐ leaf litter disturbed or washed away
  ☑ sediment deposition
  ☐ water staining
  ☐ other (list):
  ☑ the presence of litter and debris
  ☐ destruction of terrestrial vegetation
  ☐ the presence of wrack line
  ☐ sediment sorting
  ☐ scour
  ☐ multiple observed or predicted flow events
  ☐ abrupt change in plant community
☑ Discontinuous OHWM.[7] Explain: Stream 44 flows directly into fly ash wastewater treatment pond.

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
  ☐ oil or scum line along shore objects
  ☐ fine shell or debris deposits (foreshore)
  ☐ physical markings/characteristics
  ☐ tidal gauges
  ☐ other (list):
☐ Mean High Water Mark indicated by:
  ☐ survey to available datum;
  ☐ physical markings;
  ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Water color is slightly turbid with sand deposits.
Identify specific pollutants, if known:

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☑ Riparian corridor. Characteristics (type, average width): Mixed mesic forest >50'

☐ Wetland fringe. Characteristics:

☑ Habitat for:

- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☑ Aquatic/wildlife diversity. Explain findings: These waters and their buffers provide aquatic and terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Explain:

Surface flow is:

Characteristics:

Subsurface flow: Explain findings:

☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☐ Not directly abutting

- ☐ Discrete wetland hydrologic connection. Explain:
- ☐ Ecological connection. Explain:
- ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are river miles from TNW.

Project waters are aerial (straight) miles from TNW.

Flow is from:

Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width):

☐ Vegetation type/percent cover. Explain:

☐ Habitat for:

- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis:

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☑ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Water fills >75% of available area, originates from steep slope.
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☑ Tributary waters: 2,379 linear feet; 6 (ft) width.
   - ☐ Other non-wetland waters: acres.

     Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):

   ☐ Tributary waters: linear feet width (ft).

   ☐ Other non-wetland waters: acres.

   Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**

   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

   ☐ Demonstrate that impoundment was created from "waters of the U.S.," or

   ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

   ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

---

[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

- ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Stream 44 drains directly into manmade fly ash wastewater treatment pond that does not drain into TNWs.

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams):

☐ Lakes/ponds:

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

- ☐ Office concurs with data sheets/delineation report.
- ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

- ☑ USGS NHD data.
- ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey.

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: One (1) perennial stream channel, totaling 2,379 feet, functions as a headwater tributary (RPW). Stream 44 flows into Fly Ash Wastewater Treatment Pond, which flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW).

PERENNIAL STREAMS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
Stream 44	Horseford Creek	38.18353	-82.65165	2,379	Big Sandy	Fallsburg
Total: 1				**2,379 linear feet**		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, 23 Non-RPW Ephemeral Stream Channels (draining to Fuller's Branch)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.174032°, Long. -82.647949 °
Universal Transverse Mercator:
Name of nearest waterbody: Fuller's Branch
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: June 9, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs

☑ Non-RPWs that flow directly or indirectly into TNWs

☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

☐ Impoundments of jurisdictional waters

☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: Twenty-three (23) ephemeral stream channels totaling 5,163 linear feet.
Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
Identify TNW:
Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) **General Area Conditions:**
Watershed size: Big Sandy River: 410.4 square miles
Drainage area:

Average annual rainfall: 50.0 inches
Average annual snowfall: 21.0 inches

(ii) **Physical Characteristics:**
(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☑ Tributary flows through 2-3 tributaries before entering TNW.

Project waters are 1-2 river miles from TNW.
Project waters are 1 (or less) river miles from RPW.
Project waters are 1 (or less) aerial (straight) miles from TNW.
Project waters are 1 (or less) aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:
Identify flow route to TNW[5]: Stream 59a flows to Stream 59 (unnamed ephemeral tribs), which flows to Stream 68 (perennial RPW). Stream 60a flows to Stream 60 (unnamed ephemeral tribs), which flows to Stream 68. Stream 58, Stream 69, and Streams 68a flow through Stream 68r which flows into Stream 68. Stream-68 (RPW) flows into Fuller's Branch (RPW), which flows into the Big Sandy River (a TNW).
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☑ Natural

☐ Artificial (man-made). Explain:

☐ Manipulated (man-altered). Explain:

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):

Average width: 1 foot
Average depth: <1 foot
Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☑ Silts
☑ Cobbles
☐ Bedrock
☑ Other. Explain: detritus
☑ Sands
☑ Gravel
☐ Vegetation. Type/% cover:
☐ Concrete
☐ Muck

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: High gradient, highly eroding, partially veg
Presence of run/riffle/pool complexes. Explain: High gradient streams, no run/riffle/pool complex
Tributary geometry: Relatively Straight
Tributary gradient (approximate average slope): 45%

(c) Flow:

Tributary provides for: Ephemeral Flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Ephemeral
Other information on duration and volume:

Surface flow is: Discrete and Confined Characteristics:

Subsurface flow: Unknown Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☑ Bed and banks
☑ OHWM[6] (check all indicators that apply):
  ☑ clear, natural line impressed on the bank
  ☐ changes in the character of soil
  ☐ shelving
  ☐ vegetation matted down, bent, or absent
  ☑ leaf litter disturbed or washed away
  ☐ sediment deposition
  ☐ water staining
  ☐ other (list):
  ☐ the presence of litter and debris
  ☐ destruction of terrestrial vegetation
  ☐ the presence of wrack line
  ☐ sediment sorting
  ☑ scour
  ☑ multiple observed or predicted flow events
  ☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:
  ☐ oil or scum line along shore objects
  ☐ fine shell or debris deposits (foreshore)
  ☐ physical markings/characteristics
  ☐ tidal gauges
  ☐ other (list):
☐ Mean High Water Mark indicated by:
  ☐ survey to available datum;
  ☐ physical markings;
  ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Less than 1 foot of water was observed.
Identify specific pollutants, if known:

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☑ Riparian corridor. Characteristics (type, average width): Mixed mesic forest, >50'

☐ Wetland fringe. Characteristics:

☑ Habitat for:

  ☐ Federally Listed species. Explain findings:

  ☐ Fish/spawn areas. Explain findings:

  ☐ Other environmentally-sensitive species. Explain findings:

  ☑ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain:
Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Explain:

Surface flow is:
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☐ Not directly abutting

  ☐ Discrete wetland hydrologic connection. Explain:

  ☐ Ecological connection. Explain:

  ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are river miles from TNW.
Project waters are aerial (straight) miles from TNW.
Flow is from:
Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width):

☐ Vegetation type/percent cover. Explain:

☐ Habitat for:

  ☐ Federally Listed species. Explain findings:

  ☐ Fish/spawn areas. Explain findings:

  ☐ Other environmentally-sensitive species. Explain findings:

  ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis:
Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: Based on the aforementioned findings, the twenty-three (23) ephemeral tributaries function as headwater stream channels providing water, nitrogen, and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.

   Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☑ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☑ Tributary waters: Twenty-three (23) ephemeral stream channels totaling 5,163 linear feet.
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain:
- ☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters:
- ☐ Wetlands: acres.

---

[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

- ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal.

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

- ☐ Office concurs with data sheets/delineation report.
- ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

- ☑ USGS NHD data.
- ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey.

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections

☐ Previous determination(s). File no. and date of response letter:

☑ Applicable/supporting case law: *U.S. v. Cundiff*, 555 F.3d 200 (6th Cir. 2009).

☑ Applicable/supporting scientific literature:

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)
Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales.
Journal of the American Water Resources Association 43 (1), 5-14.
doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007)
The role of headwater streams in downstream water quality.
Journal of the American Water Resources Association 43 (1), 41-59.
doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007)
Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.

Journal of the American Water Resources Association 43 (1), 72-85.
doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007)
The contribution of headwater stream to biodiversity in river networks
Journal of the American Water Resources Association 43 (1), 86-103.
doi:10.1111/j.1752-1688.2007.00008.x

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The twenty (23) ephemeral stream channels, totaling 5,163 feet, function as headwater tributaries (Non-RPW) which flow into a perennial stream (Stream 68), which flow into Fuller's Branch (RPW), which flow into the Big Sandy River (TNW).

EPHEMERAL STREAMS DRAINING TO FULLER'S BRANCH WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
Stream 58	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174032	-82.647949	604	Big Sandy	Fallsburg
Stream 59	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174786	-82.646863	881	Big Sandy	Fallsburg
Stream 59a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174412	-82.646894	304	Big Sandy	Fallsburg
Stream 60	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176137	-82.646625	692	Big Sandy	Fallsburg
Stream 60a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175762	-82.647063	149	Big Sandy	Fallsburg
Stream 68a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174678	-82.648721	92	Big Sandy	Fallsburg
Stream 68b	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17473	-82.648255	62	Big Sandy	Fallsburg
Stream 68c	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17447	-82.648223	224	Big Sandy	Fallsburg
Stream 68d	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175023	-82.647836	158	Big Sandy	Fallsburg
Stream 68e	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174797	-82.648466	69	Big Sandy	Fallsburg
Stream 68f	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175329	-82.647784	68	Big Sandy	Fallsburg
Stream 68g	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174959	-82.648427	130	Big Sandy	Fallsburg
Stream 68h	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17541	-82.647479	200	Big Sandy	Fallsburg
Stream 68i	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17517	-82.648242	104	Big Sandy	Fallsburg
Stream 68j	Unamed Ephemeral (Non-RPW) Tributary of Fuller's	38.175685	-82.647456	102	Big Sandy	Fallsburg

EPHEMERAL STREAMS DRAINING TO FULLER'S BRANCH WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
	Branch					
Stream 68k	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175554	-82.647476	139	Big Sandy	Fallsburg
Stream 68l	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177244	-82.647641	65	Big Sandy	Fallsburg
Stream 68m	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177145	-82.647626	85	Big Sandy	Fallsburg
Stream 68n	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177322	-82.647374	204	Big Sandy	Fallsburg
Stream 68o	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176957	-82.647088	256	Big Sandy	Fallsburg
Stream 68p	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.1764	-82.647351	58	Big Sandy	Fallsburg
Stream 68q	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176428	-82.646887	251	Big Sandy	Fallsburg
Stream 68r	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176653	-82.647099	266	Big Sandy	Fallsburg
Total: 23 Streams				**5,163**	**Linear Feet**	

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, 20 Non-RPW Ephemeral Stream Channels and 2 Adjacent Wetlands (draining to Blaine Creek)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.179566°, Long -82.625246°
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: June 9, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. ***[Required]***

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
☑ Non-RPWs that flow directly or indirectly into TNWs
☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☑ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: Twenty (20) ephemeral stream channels totaling 3,804 linear feet.
Wetlands: Two (2) (one emergent and one emergent/scrub-shrub) wetlands totaling 0.14 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW:
Summarize rationale supporting determination:

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: Big Sandy Watershed: 410.4 square miles.
Drainage area:

Average annual rainfall: 50 inches
Average annual snowfall: 21 inches

(ii) Physical Characteristics:
(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☑ Tributary flows through 2-3 tributary before entering TNW.

Project waters are 1-2 river miles from TNW.
Project waters are 1 (or less) river miles from RPW.
Project waters are 1-2 aerial (straight) miles from TNW.
Project waters are 1 (or less) aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:
Identify flow route to TNW[5]: Streams 78a, 78b, 78c flow into Stream 78 (an ephemeral trib, which flows into Stream 4). Streams 79a and 79aa flow into Stream 79 (an ephemeral trib), which flows into Stream 4. Stream 80a flows into Stream 80 (an ephemeral trib), which flows into Stream 4. Streams 5, 26, 27, 28, 29, 72, 73, 74, 75, 76 & 77 flow into Stream 4. Stream 4 (a perennial RPW) flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW). (see sheet 7 for information on Stream 4).
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☑ Natural

☑ Artificial (man-made). Explain: Stream originates at dam outfall.

☐ Manipulated (man-altered). Explain:

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width: <1 foot
Average depth: < 1 foot
Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☑ Silts ☑ Sands ☐ Concrete
☑ Cobbles ☑ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☑ Other. Explain: detritus

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: High gradient, highly eroding.
Presence of run/riffle/pool complexes. Explain: High gradient streams. No run/riffle/pool complexes.
Tributary geometry: Relatively Straight
Tributary gradient (approximate average slope): 45%

(c) Flow:
Tributary provides for: Ephemeral Flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Ephemeral
Other information on duration and volume:

Surface flow is: Discrete and Confined Characteristics:

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
- ☑ Bed and banks
- ☑ OHWM[6] (check all indicators that apply):
  - ☑ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☑ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☑ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☑ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ☐ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ☐ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Acid Mine Drainage (AMD) appeared to be present (orange coloration in water).
Identify specific pollutants, if known: AMD appeared to be present

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☑ Riparian corridor. Characteristics (type, average width): Mixed Mesic forest, 6-20 meters

☑ Wetland fringe. Characteristics: Wetland 15 is adjacent to Str. 5; and Wetland 16 abutting Str. 26 and 27.

☑ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☑ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: 0.14 acres
Wetland type. Explain: Emergent and Emergent/Scrub-Shrub
Wetland quality. Explain: low to medium (ORAM Cat. 1 and 2)
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Ephemeral Flow Explain:

Surface flow is: Overland Sheetflow
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☑ Directly abutting

☑ Not directly abutting

☑ Discrete wetland hydrologic connection. Explain: Wetland 15 was created from hydrology from dam outfall.

☐ Ecological connection. Explain:

☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are 1-2 river miles from TNW.
Project waters are 1-2 aerial (straight) miles from TNW.
Flow is from: Wetland to Navigable Waters
Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Wetland appeared to be impacted by AMD.
Identify specific pollutants, if known: AMD appeared to be present

(iii) Biological Characteristics. Wetland supports (check all that apply):

☑ Riparian buffer. Characteristics (type, average width): The wetlands provide buffers <30'.

☑ Vegetation type/percent cover. Explain: herbaceous 80-100%; scrub-shrub 20-30%.

☑ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☑ Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 2
Approximately (0.14) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
W-15 N	0.06		
W-16 Y	0.08		

Summarize overall biological, chemical and physical functions being performed: These wetlands perform numerous functions such as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. The wetlands have the capacity to transfer nutrients and organic carbon to support downstream food-webs. The wetlands have a direct relationship on the physical, chemical and biological integrity of the Big Sandy River.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Based on the aforementioned findings, the two (2) emergent and emergent/scrub shrub wetlands, totaling 0.14 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to Streams 5, 26, and 27. The twenty (20) ephemeral tributaries function as headwater stream channels providing water, nitrogen, and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

   ☐ TNWs: linear feet width (ft), Or, acres.

   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:

   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

   Provide estimates for jurisdictional waters in the review area (check all that apply):

   ☐ Tributary waters: linear feet width (ft).

   ☐ Other non-wetland waters: acres.

   Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

   ☑ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):

   ☑ Tributary waters: Twenty (20) ephemeral stream channels totaling 3,804 linear feet.

   ☐ Other non-wetland waters: acres.

   Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

   ☑ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: Two (2) wetlands totaling 0.14 acres.

7. **Impoundments of jurisdictional waters.[9]**

   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

   ☐ Demonstrate that impoundment was created from "waters of the U.S.," or

   ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

   ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

  ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal.

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

  ☑ Office concurs with data sheets/delineation report.

  ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

  ☑ USGS NHD data.

  ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey.

☑ National wetlands inventory map(s). Cite name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.

☐ Previous determination(s). File no. and date of response letter:

☑ Applicable/supporting case law: *U.S. v. Cundiff*, 555 F.3d 200 (6th Cir. 2009).

☑ Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)
Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales.
Journal of the American Water Resources Association 43 (1), 5-14.

doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007)
The role of headwater streams in downstream water quality.
Journal of the American Water Resources Association 43 (1), 41-59.
doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007)
Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.
Journal of the American Water Resources Association 43 (1), 72-85.
doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007)
The contribution of headwater stream to biodiversity in river networks
Journal of the American Water Resources Association 43 (1), 86-103.
doi:10.1111/j.1752-1688.2007.00008.x

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The two (2) wetlands, totaling 0.14 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to an unnamed ephemeral (Non-RPW) tributaries of Blaine Creek. Twenty (20) ephemeral stream channels, totaling 3,084 feet, function as headwater tributaries (Non-RPW), which flow into a perennial stream (Stream 4), which flow into Blaine Creek (RPW), which flow into the Big Sandy River (TNW).

EPHEMERAL STREAMS AND WETLANDS DRAINING TO BLAINE CREEK WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet or acres)	HUC	Quad
Stream 05	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179566	-82.625246	70	Big Sandy	Fallsburg
Stream 26	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179403	-82.624443	178	Big Sandy	Pritchard
Stream 27	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179562	-82.624478	154	Big Sandy	Pritchard
Stream 28	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18034	-82.624501	185	Big Sandy	Pritchard
Stream 29	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.180985	-82.624289	138	Big Sandy	Pritchard
Stream 72	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.181433	-82.624959	175	Big Sandy	Fallsburg/Prichard
Stream 73	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182305	-82.625104	210	Big Sandy	Fallsburg/Prichard
Stream 74	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184755	-82.626268	336	Big Sandy	Fallsburg
Stream 75	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185768	-82.626399	108	Big Sandy	Fallsburg
Stream 76	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186226	-82.626544	385	Big Sandy	Fallsburg
Stream 77	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185364	-82.625733	36	Big Sandy	Fallsburg
Stream 78	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183861	-82.624616	354	Big Sandy	Pritchard
Stream 78a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183771	-82.624265	120	Big Sandy	Pritchard
Stream 78b	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183921	-82.62445	61	Big Sandy	Pritchard
Stream 78c	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184067	-82.624865	96	Big Sandy	Pritchard

Stream 79	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182304	-82.623863	542	Big Sandy	Pritchard
Stream 79a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182473	-82.623487	391	Big Sandy	Pritchard
Stream 79aa	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182373	-82.622941	53	Big Sandy	Pritchard
Stream 80	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186308	-82.626727	132	Big Sandy	Fallsburg
Stream 80a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18624	-82.62678	80	Big Sandy	Fallsburg
Wetland 15	PEM Wetland	38.179389	-82.625917	0.06	Big Sandy	Fallsburg
Wetland 16	PEM/PSS Wetland	38.179511	-82.624825	0.08	Big Sandy	Pritchard
Total: 20 streams, 2 wetlands				**Stream: 3,804 linear feet ; Wetlands: 0.14 acre**		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, 92 Non-RPW Ephemeral Stream Channels and 3 Adjacent Wetlands (draining to Fly Ash Pond)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.18278°, Long. -82.642085°
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: July 24, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
☑ Non-RPWs that flow directly or indirectly into TNWs
☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☑ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: Ninety-two (92) ephemeral stream channels, totaling 16,319 feet linear feet.
Wetlands: Three (3) wetlands totaling 0.15 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:
   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   Watershed size: Big Sandy Watershed: 410.4 square miles
   Drainage area:

   Average annual rainfall: 50 inches
   Average annual snowfall: 21 inches

   (ii) **Physical Characteristics:**
   (a) Relationship with TNW:

   ☐ Tributary flows directly into TNW.

   ☑ Tributary flows through 3-4 tributary before entering TNW.

   Project waters are 2-5 river miles from TNW.
   Project waters are 1-2 river miles from RPW.
   Project waters are 1-2 aerial (straight) miles from TNW.
   Project waters are 1 (or less) aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW[5]: All of the 92 ephemeral streams listed either directly flow into the fly ash wastewater treatment pond or are a tributary to a stream that flows into the wastewater treatment pond. The fly ash pond flows into Stream 30 (a perennial RPW), which flows into Blaine Creek (a perennial RPW), which flows into the Big Sandy River (a TNW).
   Tributary stream order, if known:

   (b) General Tributary Characteristics (check all that apply):

   Tributary is: ☑ Natural

   ☐ Artificial (man-made). Explain:

   ☐ Manipulated (man-altered). Explain:

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width: 2 feet
Average depth: 2 inches
Average side slopes: 3:1

Primary tributary substrate composition (check all that apply):

☑ Silts ☑ Sands ☐ Concrete
☑ Cobbles ☑ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: variable, see forms
Presence of run/riffle/pool complexes. Explain: High gradient streams, no run/riffle/pool complex
Tributary geometry: variable, see forms
Tributary gradient (approximate average slope): 45 %

(c) Flow:
Tributary provides for: Ephemeral Flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Ephemeral
Other information on duration and volume:

Surface flow is: Characteristics:

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☑ Bed and banks
☑ OHWM[6] (check all indicators that apply):
- ☑ clear, natural line impressed on the bank
- ☐ changes in the character of soil
- ☐ shelving
- ☐ vegetation matted down, bent, or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other (list):
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☑ scour
- ☑ multiple observed or predicted flow events
- ☐ abrupt change in plant community

☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
- ☐ oil or scum line along shore objects
- ☐ fine shell or debris deposits (foreshore)
- ☐ physical markings/characteristics
- ☐ tidal gauges
- ☐ other (list):

☐ Mean High Water Mark indicated by:
- ☐ survey to available datum;
- ☐ physical markings;
- ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Water color observed was generally clear.
Identify specific pollutants, if known:

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☑ Riparian corridor. Characteristics (type, average width): Mixed mesic forest >50'

☑ Wetland fringe. Characteristics: Stream 44a has two (2) abutting wetlands (Wetland 01 and 02). Stream 50 has one (1) abutting wetland (Wetland 09).

☑ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☑ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: 0.15 acres

Wetland type. Explain: Emergent/Scrub-Shrub

Wetland quality. Explain: Low

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: No Flow Explain:

Surface flow is:

Characteristics:

Subsurface flow: Explain findings:

☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☑ Directly abutting

☐ Not directly abutting

☐ Discrete wetland hydrologic connection. Explain:

☐ Ecological connection. Explain:

☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are 2-5 river miles from TNW.

Project waters are 1-2 aerial (straight) miles from TNW.

Flow is from: No Flow

Estimate approximate location of wetland as within the 500-year or greater floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Water was not noted on wetland forms.

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☑ Riparian buffer. Characteristics (type, average width): The wetlands provide narrow buffers < 50'.

☑ Vegetation type/percent cover. Explain: herbaceous: 50%, sapling/shrub: 50%.

☑ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☑ Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 3

Approximately (0.15) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
W-01 Y	0.06		
W-02 Y	0.03		
W-09 Y	0.06		

Summarize overall biological, chemical and physical functions being performed: These wetlands perform limited functions including erosion and sediment control, pollution control through filtering and providing wildlife habitat.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Based on the aforementioned findings, the three (3) emergent and emergent/scrub shrub wetlands (W1, W2 & W9), totaling 0.15 acres, provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to Streams 44a and Stream 50. The ninety-two (92) ephemeral tributaries (see Table 1 under Section IV, B for list) function as headwater stream channels providing water, nitrogen, and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   ☐ TNWs: linear feet width (ft), Or, acres.
   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   ☐ Tributary waters: linear feet width (ft).
   ☐ Other non-wetland waters: acres.
   Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

  ☑ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

  Provide estimates for jurisdictional waters within the review area (check all that apply):

  ☑ Tributary waters: Ninety-two (92) ephemeral stream channels, totaling 16,319 feet linear feet.

  ☐ Other non-wetland waters: acres.

  Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

  ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

  ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

  ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

  Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

  ☑ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

  Provide acreage estimates for jurisdictional wetlands in the review area: 3 wetlands totaling 0.15 acres

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

  ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

  Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**

  As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

  ☐ Demonstrate that impoundment was created from "waters of the U.S.," or

  ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

  ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*

☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams):

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands:

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal.

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

  ☑ Office concurs with data sheets/delineation report.

  ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

  ☑ USGS NHD data.

  ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.

☐ Previous determination(s). File no. and date of response letter:

☑ Applicable/supporting case law: *U.S. v. Cundiff*, 555 F.3d 200 (6th Cir. 2009).

☑ Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)
Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales.
Journal of the American Water Resources Association 43 (1), 5-14.
doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007)
The role of headwater streams in downstream water quality.
Journal of the American Water Resources Association 43 (1), 41-59.

doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007)
Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.
Journal of the American Water Resources Association 43 (1), 72-85.
doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007)
The contribution of headwater stream to biodiversity in river networks
Journal of the American Water Resources Association 43 (1), 86-103.
doi:10.1111/j.1752-1688.2007.00008.x

☑ Other information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013).

B. ADDITIONAL COMMENTS TO SUPPORT JD: The three (3) emergent and emergent/scrub shrub wetlands (W1, W2 & W9), totaling 0.15 acres, provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to Streams 44a and Stream 50. The ninety-two (92) ephemeral tributaries (see Table 1 under Section IV, B for list) function as headwater stream channels providing water, nitrogen, and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW.

TABLE 1

EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 01	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18278	-82.642085	402	Big Sandy	Fallsburg
Stream 01a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18292	-82.642209	176	Big Sandy	Fallsburg
Stream 02	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182358	-82.641507	411	Big Sandy	Fallsburg
Stream 02a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182345	-82.641158	157	Big Sandy	Fallsburg
Stream 03	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182731	-82.642327	313	Big Sandy	Fallsburg
Stream 06	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180497	-82.640554	170	Big Sandy	Fallsburg
Stream 07	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18074	-82.64076	278	Big Sandy	Fallsburg
Stream 08	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182257	-82.642054	101	Big Sandy	Fallsburg
Stream 09	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182792	-82.64174	479	Big Sandy	Fallsburg
Stream 09a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182594	-82.641687	119	Big Sandy	Fallsburg
Stream 09b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182694	-82.64161	194	Big Sandy	Fallsburg
Stream 10	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183665	-82.644132	95	Big Sandy	Fallsburg
Stream 11a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18441	-82.643544	117	Big Sandy	Fallsburg
Stream 11b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184944	-82.643781	104	Big Sandy	Fallsburg
Stream 11c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184638	-82.64308	381	Big Sandy	Fallsburg
Stream 11d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184545	-82.64252	129	Big Sandy	Fallsburg
Stream 11e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184364	-82.644005	62	Big Sandy	Fallsburg
Stream 12	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184279	-82.644254	95	Big Sandy	Fallsburg

TABLE 1
EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 13a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185804	-82.648927	56	Big Sandy	Fallsburg
Stream 13b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186405	-82.648953	306	Big Sandy	Fallsburg
Stream 13c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186111	-82.649453	185	Big Sandy	Fallsburg
Stream 14	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177507	-82.639347	183	Big Sandy	Fallsburg
Stream 15a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176481	-82.642261	47	Big Sandy	Fallsburg
Stream 15b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176163	-82.642182	104	Big Sandy	Fallsburg
Stream 15c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176046	-82.642318	173	Big Sandy	Fallsburg
Stream 15d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175778	-82.642329	245	Big Sandy	Fallsburg
Stream 15e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175752	-82.642651	61	Big Sandy	Fallsburg
Stream 15f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175687	-82.643729	646	Big Sandy	Fallsburg
Stream 15g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175682	-82.643372	275	Big Sandy	Fallsburg
Stream 16	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17767	-82.642599	132	Big Sandy	Fallsburg
Stream 17a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179664	-82.644962	111	Big Sandy	Fallsburg
Stream 17b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179373	-82.645296	112	Big Sandy	Fallsburg
Stream 17c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178786	-82.646264	233	Big Sandy	Fallsburg
Stream 18a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182426	-82.64647	93	Big Sandy	Fallsburg
Stream 18b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182388	-82.646877	100	Big Sandy	Fallsburg
Stream 18c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182425	-82.647548	113	Big Sandy	Fallsburg
Stream 18d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182362	-82.647975	87	Big Sandy	Fallsburg
Stream 18e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82.648736	43	Big Sandy	Fallsburg
Stream 18f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182427	-82.64916	114	Big Sandy	Fallsburg
Stream 18g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182275	-82.649426	69	Big Sandy	Fallsburg
Stream 19	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183625	-82.646425	182	Big Sandy	Fallsburg
Stream 20	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184248	-82.649346	740	Big Sandy	Fallsburg
Stream 20a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184416	-82.648381	81	Big Sandy	Fallsburg
Stream 20b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183988	-82.649448	138	Big Sandy	Fallsburg
Stream 20c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183736	-82.64961	294	Big Sandy	Fallsburg

TABLE 1
EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 21	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183258	-82.637508	84	Big Sandy	Fallsburg
Stream 23	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183783	-82.638926	165	Big Sandy	Fallsburg
Stream 23a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183776	-82.63877	77	Big Sandy	Fallsburg
Stream 24	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181997	-82.635548	177	Big Sandy	Fallsburg
Stream 25	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182203	-82.63839	415	Big Sandy	Fallsburg
Stream 33	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183828	-82.6441	64	Big Sandy	Fallsburg
Stream 34	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184202	-82.643787	141	Big Sandy	Fallsburg
Stream 34a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184134	-82.643645	100	Big Sandy	Fallsburg
Stream 35a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185921	-82.645834	211	Big Sandy	Fallsburg
Stream 35b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185204	-82.6465	78	Big Sandy	Fallsburg
Stream 36	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177545	-82.638531	280	Big Sandy	Fallsburg
Stream 37	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176969	-82.642526	171	Big Sandy	Fallsburg
Stream 38	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17922	-82.644498	279	Big Sandy	Fallsburg
Stream 40	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1813	-82.645778	157	Big Sandy	Fallsburg
Stream 41a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18117	-82.646067	56	Big Sandy	Fallsburg
Stream 42	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182146	-82.648394	114	Big Sandy	Fallsburg
Stream 43	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184011	-82.647594	368	Big Sandy	Fallsburg
Stream 44a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18488	-82.650217	554	Big Sandy	Fallsburg
Stream 44b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182484	-82.653843	633	Big Sandy	Fallsburg
Stream 44c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181227	-82.653997	232	Big Sandy	Fallsburg
Stream 45	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183078	-82.637348	93	Big Sandy	Fallsburg
Stream 47	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82.635048	48	Big Sandy	Fallsburg
Stream 48	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183095	-82.638419	73	Big Sandy	Fallsburg
Stream 49	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181963	-82.637701	109	Big Sandy	Fallsburg
Stream 50	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185788	-82.635826	116	Big Sandy	Fallsburg
Stream 51	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185756	-82.635877	75	Big Sandy	Fallsburg
Stream 52	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181211	-82.628042	47	Big Sandy	Fallsburg

TABLE 1
EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 53	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182467	-82.627866	64	Big Sandy	Fallsburg
Stream 54	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182315	-82.627723	39	Big Sandy	Fallsburg
Stream 55	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184567	-82.629622	88	Big Sandy	Fallsburg
Stream 56	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178126	-82.633154	36	Big Sandy	Fallsburg
Stream 57	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178022	-82.630229	43	Big Sandy	Fallsburg
Stream 61	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180213	-82.627552	31	Big Sandy	Fallsburg
Stream 62	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182122	-82.627641	70	Big Sandy	Fallsburg
Stream 63	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182254	-82.627658	77	Big Sandy	Fallsburg
Stream 64	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184825	-82.629898	77	Big Sandy	Fallsburg
Stream 65	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185999	-82.630599	19	Big Sandy	Fallsburg
Stream 66	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186103	-82.630655	30	Big Sandy	Fallsburg
Stream 67	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178037	-82.63036	51	Big Sandy	Fallsburg
Stream 70a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183487	-82.651216	75	Big Sandy	Fallsburg
Stream 70b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183499	-82.650664	310	Big Sandy	Fallsburg
Stream 71a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185856	-82.652998	262	Big Sandy	Fallsburg
Stream 71b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18583	-82.653492	131	Big Sandy	Fallsburg
Stream 71c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186375	-82.654015	548	Big Sandy	Fallsburg
Stream 71d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1858	-82.654716	440	Big Sandy	Fallsburg
Stream 71e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185899	-82.655866	81	Big Sandy	Fallsburg
Stream 71f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185596	-82.655933	222	Big Sandy	Fallsburg
Wetland 01	PEM/PSS Wetland	38.185144	-82.65042	0.06	Big Sandy	Fallsburg
Wetland 02	PEM Wetland	38.184948	-82.650542	0.03	Big Sandy	Fallsburg
Wetland 09	PEM/PSS Wetland	38.185936	-82.635573	0.06	Big Sandy	Fallsburg
Total: 92 Streams, 3 Wetlands		**TOTAL: Streams: 16,319 linear feet, Wetlands: 0.15 acre**				

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channel and Abutting Wetlands (draining to Blaine Creek)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.179875°, Long -82.625015°
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: July 24, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. *[Required]*

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☑ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs

☐ Non-RPWs that flow directly or indirectly into TNWs

☑ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

☐ Impoundments of jurisdictional waters

☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: One (1) intermittent stream channel totaling 3,343 linear feet: 1' width (ft).
Wetlands: Two (2) emergent/scrub-shrub and forested wetlands totaling 0.76 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**

Identify TNW:

Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) General Area Conditions:

Watershed size: Big Sandy Watershed: 410.4 square miles.
Drainage area:

Average annual rainfall: 50 inches
Average annual snowfall: 21 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☑ Tributary flows through 1 tributary before entering TNW.

Project waters are 1-2 river miles from TNW.
Project waters are NA river miles from RPW.
Project waters are 1-2 aerial (straight) miles from TNW.
Project waters are NA aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW[5]: Stream 4 (an intermittent RPW) flows into Blaine Creek (a perennial RPW), which flows into the Big Sandy River (a TNW).
Tributary stream order, if known: Second

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural

☐ Artificial (man-made). Explain:

☑ Manipulated (man-altered). Explain: Culvert and access road over Stream 4 near Blaine Creek. Stream 4 begins from a wetland that was created from a dam outfall.

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width: 1 foot
Average depth: 3 inches
Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

- ☑ Silts
- ☐ Sands
- ☐ Concrete
- ☑ Cobbles
- ☑ Gravel
- ☐ Muck
- ☐ Bedrock
- ☐ Vegetation. Type/% cover:
- ☑ Other. Explain: detritus

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Fairly stable, vegetated.
Presence of run/riffle/pool complexes. Explain: No run/riffle/pool complexes.
Tributary geometry: Relatively Straight
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: Seasonal Flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Intermittent
Other information on duration and volume: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inches of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceed three months.

Surface flow is: Discrete and Confined Characteristics:

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
- ☑ Bed and banks
- ☑ OHWM[6] (check all indicators that apply):
  - ☑ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☑ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☑ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☑ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ☐ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ☐ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Acid Mine Drainage (AMD) appeared to be present (orange coloration in water).
Identify specific pollutants, if known: AMD appeared to be present

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☑ Riparian corridor. Characteristics (type, average width): >18 meters
- ☑ Wetland fringe. Characteristics: Wetlands 14 and 17 abut Stream 4.
- ☑ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☑ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: 0.76 acres
Wetland type. Explain: Emergent/Scrub-Shrub and Forested
Wetland quality. Explain: Low to Medium, ORAM Category 1 and 2
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Intermittent Flow Explain:

Surface flow is: Overland Sheetflow
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- ☑ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain:
  - ☐ Ecological connection. Explain:
  - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are 1-2 river miles from TNW.
Project waters are 1-2 aerial (straight) miles from TNW.
Flow is from: Wetland to Navigable Waters
Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Wetland appeared to be impacted by AMD.
Identify specific pollutants, if known: AMD appeared to be present

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☑ Riparian buffer. Characteristics (type, average width): The wetlands provide buffers <30'.
- ☑ Vegetation type/percent cover. Explain: herbaceous 80-100%; scrub-shrub 20-30% and forested 80-100%.
- ☑ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☑ Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 2
Approximately (0.76) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
W-14 Y	0.21		
W-17 Y	0.55		

Summarize overall biological, chemical and physical functions being performed: These wetlands perform numerous functions such as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. The wetlands have the capacity to transfer nutrients and organic carbon to support downstream food-webs. The wetlands have a direct relationship on the physical, chemical and biological integrity of the Big Sandy River.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

   ☐ TNWs: linear feet width (ft), Or, acres.

   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:

   ☑ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inches of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceed three months.

   Provide estimates for jurisdictional waters in the review area (check all that apply):

   ☑ Tributary waters: One (1) intermittent stream channel totaling 3,343 linear feet.

   ☐ Other non-wetland waters: acres.

   Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters:

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

☑ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☑ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetlands 14 and 17 are physically proximate to Stream 04.

Provide acreage estimates for jurisdictional wetlands in the review area: Two (2) wetlands totaling 0.76 acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

7. **Impoundments of jurisdictional waters.[9]**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- ☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource:
- ☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource:
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☑ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☑ U.S. Geological Survey Hydrologic Atlas:
  - ☑ USGS NHD data.
  - ☑ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
- ☑ National wetlands inventory map(s). Cite name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.
- ☐ State/Local wetland inventory map(s):
- ☑ FEMA/FIRM maps: 21127C120D
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☑ Photographs: ☐ Aerial (Name & Date):
- ☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
- ☐ Previous determination(s). File no. and date of response letter:
- ☑ Applicable/supporting case law: *U.S. v. Cundiff*, 555 F.3d 200 (6th Cir. 2009).
- ☑ Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)
Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales.
Journal of the American Water Resources Association 43 (1), 5-14.

doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007)
The role of headwater streams in downstream water quality.
Journal of the American Water Resources Association 43 (1), 41-59.
doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007)
Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.
Journal of the American Water Resources Association 43 (1), 72-85.
doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007)
The contribution of headwater stream to biodiversity in river networks
Journal of the American Water Resources Association 43 (1), 86-103.
doi:10.1111/j.1752-1688.2007.00008.x

☑ Other information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013).

B. ADDITIONAL COMMENTS TO SUPPORT JD: Based on the aforementioned findings, the two (2) emergent/scrub shrub and forested wetlands, totaling 0.76 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to the one (1) identified unnamed intermittent (RPW) tributary (Stream 4). This intermittent tributary functions as a headwater stream channel providing water, nitrogen and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

INTERMITTENT STREAMS AND WETLANDS DRAINING TO BLAINE CREEK WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - streams, or acres - wetlands)	HUC	Quad
Stream 04	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.179875	-82.625015	3,343	Big Sandy	Fallsburg and Pritchard
Wetland 14	PEM/PSS Wetland	38.179076	-82.625342	0.21	Big Sandy	Fallsburg
Wetland 17	PFO Wetland	38.185963	-82.625944	0.55	Big Sandy	Fallsburg
Total: 1 stream, 2 wetlands				**Stream: 3,343 linear feet; Wetlands: 0.76 acre**		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa
Center coordinates of site (lat/long in degree decimal format): Lat. 38.184825°, Long -82.643639°
Universal Transverse Mercator:
Name of nearest waterbody: Blaine Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River
Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

☑ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☑ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: August 1, 2014

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. *[Required]*

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas

☐ Wetlands adjacent to TNWs

☑ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs

☐ Non-RPWs that flow directly or indirectly into TNWs

☑ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

☑ Impoundments of jurisdictional waters

☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: Twelve (12) intermittent stream channels totaling 8,377 linear feet.
Wetlands: One (1) emergent/scrub-shrub wetland totaling 0.03 acres (Wetland 06).
Ponds: One (1) pond totaling 0.24 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM
Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
Identify TNW:
Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) General Area Conditions:
Watershed size: Big Sandy Watershed: 410.4 square miles.
Drainage area:

Average annual rainfall: 50 inches
Average annual snowfall: 21 inches

(ii) Physical Characteristics:
(a) Relationship with TNW:

☐ Tributary flows directly into TNW.

☑ Tributary flows through 3 tributaries before entering TNW.

Project waters are 2-5 river miles from TNW.
Project waters are NA river miles from RPW.
Project waters are 2-5 aerial (straight) miles from TNW.
Project waters are NA aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW[5]: Streams 11, 13, 15, 17, 18, 22, 35, 39, 41, 46, 70, and 71 all flow into the fly ash waste water treatment pond. The fly ash pond flows into Stream 30 (a perennial RPW), which flows into Blaine Creek (a perennial RPW). Blaine Creek flows into the Big Sandy River (a TNW).
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☑ Natural

☐ Artificial (man-made). Explain:

☐ Manipulated (man-altered). Explain:

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate):
Average width: 2 feet
Average depth: 4 inches
Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☑ Silts
☑ Cobbles
☐ Bedrock
☑ Other. Explain: boulder, clay

☑ Sands
☑ Gravel
☐ Vegetation. Type/% cover:

☐ Concrete
☐ Muck

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Fairly stable, vegetated.
Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes observed in Streams 15 and 71.
Tributary geometry: Relatively Straight
Tributary gradient (approximate average slope): 15%

(c) Flow:
Tributary provides for: Seasonal Flow
Estimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Seasonal intermittent

Other information on duration and volume: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there is an average of approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area.

Surface flow is: Discrete and Confined Characteristics:

Subsurface flow: Unknown Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☑ Bed and banks
☑ OHWM[6] (check all indicators that apply):
☑ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):

☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☑ multiple observed or predicted flow events
☐ abrupt change in plant community

☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):

☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Water color in some streams appeared to be clear and were observed as turbid in other streams.
Identify specific pollutants, if known:

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[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☑ Riparian corridor. Characteristics (type, average width): Wooded >30'

☑ Wetland fringe. Characteristics: Wetland 06 abuts Stream 22. Wetland 08 is located 25 feet to the southwest of Stream 46, Pond 01 abuts Stream 15.

☑ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☑ Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: 0.03 acres
Wetland type. Explain: Emergent/Scrub-Shrub
Wetland quality. Explain: Medium, ORAM Category 2 (Wetland 06)
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Ephemeral Flow Explain:

Surface flow is: Overland Sheetflow
Characteristics:

Subsurface flow: Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☑ Directly abutting: Wetland 06 directly abuts Stream 22

☑ Not directly abutting

☑ Discrete wetland hydrologic connection. Explain: Wetland 06 is located in close proximity to Stream 22.

☑ Ecological connection. Explain: Wetland 06 is located in close proximity to Stream 22 and provides stormwater attenuation, filtering and wildlife habitat.

☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are 2-5 river miles from TNW.
Project waters are 2-5 aerial (straight) miles from TNW.
Flow is from: Wetland to Navigable Waters
Estimate approximate location of wetland as within the 500-year or greater floodplain.

(ii) Chemical Characteristics:
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☑ Riparian buffer. Characteristics (type, average width): Buffers >30'.

☑ Vegetation type/percent cover. Explain: herbaceous 75%, sapling/shrub: 25% (Wetland 06)

☑ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☑ Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)
All wetland(s) being considered in the cumulative analysis: 1
Approximately (0.03) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
W-06 Y	0.03		

Summarize overall biological, chemical and physical functions being performed: Wetland 06 performs numerous functions such as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. Wetland 06 has the capacity to transfer nutrients and organic carbon to support downstream food-webs, and it has a direct relationship on the physical, chemical and biological integrity of the Big Sandy River.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

☐ TNWs: linear feet width (ft), Or, acres.

☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:

☑ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceeds three months.

Provide estimates for jurisdictional waters in the review area (check all that apply):

☑ Tributary waters: Twelve (12) intermittent stream channels totaling 8,377 linear feet.

☑ Other non-wetland waters: 0.24 acres.
Identify type(s) of waters: Pond 1

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters:

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

☑ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☑ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetland 06 (0.03 acres) is physically proximate to Stream 22.

Provide acreage estimates for jurisdictional wetlands in the review area: One wetland (Wetland 06) totaling 0.03 acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area:

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

7. **Impoundments of jurisdictional waters.[9]**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain:

☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

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[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

  ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based <u>solely</u> on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands:

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource: .

☐ Wetlands:

<u>SECTION IV: DATA SOURCES.</u>

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

  ☑ Office concurs with data sheets/delineation report.

  ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☑ U.S. Geological Survey Hydrologic Atlas:

  ☑ USGS NHD data.

  ☑ USGS 8 and 12 digit HUC maps.

☑ U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey

☑ National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.

☐ State/Local wetland inventory map(s):

☑ FEMA/FIRM maps: 21127C0120D

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☐ Aerial (Name & Date):

☐ or ☑ Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.

☐ Previous determination(s). File no. and date of response letter:

☑ Applicable/supporting case law: *U.S. v. Cundiff*, 555 F.3d 200 (6th Cir. 2009).

☑ Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)
Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales.
Journal of the American Water Resources Association 43 (1), 5-14.
doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007)
The role of headwater streams in downstream water quality.
Journal of the American Water Resources Association 43 (1), 41-59.

doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007)
Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.
Journal of the American Water Resources Association 43 (1), 72-85.
doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007)
The contribution of headwater stream to biodiversity in river networks
Journal of the American Water Resources Association 43 (1), 86-103.
doi:10.1111/j.1752-1688.2007.00008.x

☑ Other information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013)

B. ADDITIONAL COMMENTS TO SUPPORT JD: Based on the aforementioned findings, the one (1) wetland (Wetland 06), totaling 0.03 acres provides flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat and is proximate to one (1) unnamed intermittent (RPW) stream (Stream 22) that flows into the fly ash waste water treatment pond. The remaining eleven (11) intermittent streams and Pond 1 also flow into the fly ash waste water treatment pond (which is not considered a "water of the U.S." per 33 C.F.R. § 328.3(a)(8). The fly ash pond discharges into Stream 30 (a perennial RPW), which discharges into Blaine Creek (a perennial RPW). Blaine Creek flows into the Big Sandy River (a TNW). These intermittent tributaries function as a headwater stream channels providing water, nitrogen and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

INTERMITTENT STREAMS, WETLANDS, AND PONDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size	HUC	Quad
Stream 11	Tributary to fly ash pond	38.184825	-82.643639	491	Big Sandy	Fallsburg
Stream 13	Tributary to fly ash pond	38.185593	-82.648905	816	Big Sandy	Fallsburg
Stream 15	Tributary to fly ash pond	38.17573	-82.642819	895	Big Sandy	Fallsburg
Stream 17	Tributary to fly ash pond	38.179089	-82.645326	797	Big Sandy	Fallsburg
Stream 18	Tributary to fly ash pond	38.18225	-82.648104	1,120	Big Sandy	Fallsburg
Stream 22	Tributary to fly ash pond	38.183653	-82.63824	186	Big Sandy	Fallsburg
Stream 35	Tributary to fly ash pond	38.185591	-82.646285	561	Big Sandy	Fallsburg
Stream 39	Tributary to fly ash pond	38.181365	-82.645372	169	Big Sandy	Fallsburg
Stream 41	Tributary to fly ash pond	38.181378	-82.645992	652	Big Sandy	Fallsburg
Stream 46	Tributary to fly ash pond	38.18363	-82.638883	432	Big Sandy	Fallsburg
Stream 70	Tributary to fly ash pond	38.183888	-82.650984	442	Big Sandy	Fallsburg
Stream 71	Tributary to fly ash pond	38.185572	-82.653279	1,816	Big Sandy	Fallsburg
Wetland 06	PEM/PSS Wetland	38.185745	-82.637086	0.03	Big Sandy	Fallsburg
Pond 01	Pond	38.177116	-82.641885	0.24	Big Sandy	Fallsburg
Total: 12 streams, 1 wetland, 1 pond				**Stream: 8,377 linear feet** **Wetland: 0.03 acre** **Pond: 0.24 acre**		

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: American Electirc Power		File Number: LRL-2014-417-mdh	Date: 9/18/2014
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
X	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Mr. Michael Hasty, Senior Project Manager US Army Engineer District Louisville Attn: CELRL-OP-FS PO Box 59 Louisville, KY 40201-0059 TEL (502) 315-6676; FAX (502) 315-6677 michael.d.hasty@usace.army.mil	If you only have questions regarding the appeal process you may also contact: US Army Corps of Engineers ATTN: Appeal Review Officer CELRD-PD-REG 550 Main Street RM 10524 Cincinnati, OH 45202-3222 TEL (513) 684-6212; FAX (513) 684-2460

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.	Date:	Telephone number:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

May 16, 2012

Ms. Rebekah Hovermale
Environmental Specialist II
Water and Ecological Resource Services
American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215

Re: FWS 2012-B-0544; American Electric Power, Big Sandy Plant Landfill Project, located in Lawrence County, Kentucky

Dear Ms. Hovermale:

The U.S. Fish and Wildlife Service (Service) has reviewed your correspondence of April 27, 2012 regarding the above-referenced project. The Service offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the Indiana bat (*Myotis sodalis*) is the only federally listed species that has the potential to occur within the project vicinity.

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

Summer roost habitat for the endangered Indiana bat may exist within the proposed project site. Based on this information, we believe that: (1) forested areas in the vicinity of and on the project area may provide potentially suitable summer roosting and foraging habitat for the Indiana bat. Our belief that potentially suitable habitat may be present is based on the information provided in your correspondence, the fact that much of the project site and/or surrounding areas contain forested habitats that are within the natural range of this species, and our knowledge of the life history characteristics of the species.

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

Prior to hibernation, Indiana bats utilize the forest habitat around the hibernacula (*i.e.* cave), where they feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and may last from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation. Research has shown that bats exhibiting this "swarming" behavior will range up to five miles from chosen hibernacula during this time. For hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation.

Because we have concerns relating to the Indiana bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we have the following recommendation relative to Indiana bats.

- We recommend that the project proponent only remove trees within the project area between October 15 and March 31 in order to avoid impacting summer roosting Indiana bats.

However, if this recommendation cannot be incorporated as a project condition, then the project area may be surveyed to determine the presence or absence of this species within the project area in an effort to determine if potential impacts to the Indiana bat are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

If your project schedule requires the clearing of potential Indiana bat habitat (*i.e.*, trees that are greater than 5 inches DBH and exhibit any of the following characteristics: exfoliating bark, cracks, crevices, dead portions, cavities, broken limbs) during the period of April 1 to October 14, you have two primary options for addressing impacts to Indiana bats. First, you can survey the project site as described previously, or you can enter into a Conservation Memorandum of Agreement (MOA) with the Service. By entering into a Conservation MOA with the Service, Cooperators gain flexibility in project timing with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures as set forth in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact James Gruhala at (502) 695-0468 extension 116.

Sincerely,

Virgil Lee Andrews

Virgil Lee Andrews, Jr.
Field Supervisor

Steven L. Beshear
Governor

Leonard K. Peters
Secretary
Energy and Environment Cabinet

Donald S. Dott, Jr.
Director

Commonwealth of Kentucky
Kentucky State Nature Preserves Commission
801 Schenkel Lane
Frankfort, Kentucky 40601-1403
502-573-2886 Voice
502-573-2355 Fax

May 23, 2012

Matthew Thomayer
URS Corporation
36 East Seventh St., Ste 2300
Cincinnati, OH 45202

Data Request 12-107

Dear Mr. Thomayer:

This letter is in response to your data request of May 16, 2012 for the AEP Big Sandy Plant Landfill project (Lawrence County) project. We have reviewed our Natural Heritage Program Database to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the Kentucky State Nature Preserves Commission occur near the project area on the Fallsburg and Pritchard USGS Quadrangle, as shown on the map provided. Please see the attached reports for more information, which reflect analysis of the project area with three buffers applied:

1-mile for all records – 2 records
5-mile for aquatic records – 3 records
5-mile for federally listed species – 1 record
10-mile for mammals and birds – 1 record

None of our records were found within ½ mile of the project boundary.

Haliaeetus leucocephalus (Bald eagle, federally delisted, KSNPC threatened) is known to occur within ten miles of the proposed project. This species can be found near seacoasts, rivers and large lakes. Preferentially roosts in conifers in winter in some areas. In winter, may associate with waterfowl concentrations or congregate in areas with abundant dead fish.

Several monitored and even federally listed aquatic species have been previously reported from Blaine Creek and the Big Sandy River in the area of the project. Even though these are possibly extirpated from the area, aquatic species and habitats are sensitive to increased turbidity, sediment, and other adverse influences on water quality and should be protected from further degradation. Our data are not sufficient to guarantee absence of endangered, threatened or sensitive species from the sites of proposed disturbance. We recommend that impacted streams be thoroughly surveyed by a qualified biologist prior to any in-stream disturbance.

I would like to take this opportunity to remind you of the terms of the data request license, which you agreed upon in order to submit your request. The license agreement states "Data and data products received from the Kentucky State Nature Preserves Commission, including any portion thereof, may not be reproduced in any form or by any means without the express written authorization of the Kentucky State Nature Preserves Commission." The exact location of plants, animals, and natural communities, if released by the Kentucky State Nature Preserves Commission, may not be released in any document or correspondence. These products are provided on a temporary basis for the express project (described above) of the requester, and may not be redistributed, resold or copied without the written permission of the Kentucky State Nature Preserves Commission's Data Manager (801 Schenkel Lane, Frankfort, KY, 40601. Phone: (502) 573-2886).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed, and new plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. We would greatly appreciate receiving any pertinent information obtained as a result of on-site surveys.

If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Sara Hines
Data Manager

SLD/SGH

Enclosures: Data Report and Interpretation Key

Donald S. Dott, Jr.
Director

Steven L. Beshear
Governor

Commonwealth of Kentucky
Kentucky State Nature Preserves Commission
801 Schenkel Lane
Frankfort, Kentucky 40601-1403
502-573-2886 Voice
502-573-2355 Fax

INVOICE

May 23 2012

Matthew Thomayer
URS Corporation
36 East Seventh St., Ste 2300
Cincinnati, OH 45202

Purchase Order Number _________________ Data Request 12-107

This letter is an invoice for the amount of $ _84.38____ for data services requested in your letter of May 16, 2012 for AEP Big Sandy Plant Landfill project (Lawrence County) project.

Please make payment to the Kentucky Nature Preserves Fund and include the Data Request number on your check. Payment is due upon receipt.

Please contact us if we can be of further assistance.

AUG 22 2014

STEVEN L. BESHEAR
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL

BOB STEWART
SECRETARY

THE STATE HISTORIC PRESERVATION OFFICE
300 WASHINGTON STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

CRAIG A. POTTS
EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

August 14, 2014

Ms. Jill N. Lukehart
Water and Ecological Resource Services
American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373

Re: Phase I Archaeological Survey of American Electric Power's Big Sandy Plant Pond Closure Project in Lawrence County, Kentucky by Crista M. Haag of URS

Dear Ms. Lukehart:

Thank you for the above referenced report. This project entailed pedestrian survey and shovel testing of the project area. No new historic or prehistoric archaeological sites were recorded as a result of this survey, and the author recommends no further investigations of the project area. I concur with the author's findings and recommendations. We have no further comments and your responsibility to consult with the Kentucky State Historic Preservation Officer under the Section 106 review process for this project is fulfilled.

If the project design or boundaries change, this office should be consulted to determine the nature and extent of additional documentation that may be needed. In the event of the unanticipated discovery of an archaeological site or object of antiquity, the discovery should be reported to the Kentucky Heritage Council and to the Kentucky Office of State Archaeology in the Anthropology Department at the University of Kentucky in accordance with KRS 164.730. In the event that human remains are encountered during project activities, all work should be immediately stopped in the area and the area cordoned off, and in accordance with KRS 72.020 the county coroner and local law enforcement must be contacted immediately. Upon confirmation that the human remains are not of forensic interest, the unanticipated discovery must be reported to the Kentucky Heritage Council.

Should you have any questions, feel free to contact Yvonne Sherrick of my staff at 502.564.7005, extension 113.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: KHC # 42219-3
Cc: George Crothers (OSA)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

DEC 24 2014

December 12, 2014

12/24

Mr. Alan. Wood, P.E.
Director, Water & Ecological Resource Services
American Electric Power, Environmental Services
1 Riverside Plaza
Columbus, Ohio 43215-2373

Re: FWS 2012-B-0544; American Electric Power, Big Sandy Plant, Fly Ash Pond Closure Project, located in Lawrence County, Kentucky

Dear Mr. Wood:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed your November 14, 2014 correspondence regarding the proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity. The listed species are:

Group	Species	Common name	Legal* Status
Mammals	***Myotis sodalis***	**Indiana bat**	**E**
	Myotis septentrionalis	**Northern long-eared bat**	**P**

** Key to notations: E = Endangered, T = Threatened, P = Proposed, C = Candidate, CH = Critical Habitat*

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

The proposed project is located in Indiana bat "potential habitat," therefore we believe that: (1) caves, rockshelters, and abandoned underground mines in the vicinity of and in the project area may potentially provide suitable wintering habitat for the Indiana bat; and (2) forested areas in the vicinity of and in the project area may potentially provide suitable summer roosting and foraging habitat for the Indiana bat. In order to address the concerns and be in compliance with the ESA, we have the following comments and recommendations relative to potential direct and/or indirect effects as a result of impacts to the habitats listed above:

Indiana bat winter (hibernacula) habitat

According to your correspondence, a field site assessment report confirmed that the proposed project area lacks potential Indiana bat hibernacula habitat (*i.e.*; caves, abandoned mines, sink holes). Based on this information, the Service believes that the proposed project would have no effect to the Indiana bat hibernacula habitat.

Indiana bat summer roost / foraging habitat

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH. According to your correspondence, the proposed project would result in the removal of some potential Indiana bat summer roost / foraging habitat.

Your request indicates that the project proponent will commit to conducting all project-associated tree removal during "unoccupied" time. The Service believes that conducting all project-associated tree removal between the dates of October 15th and March 31st would likely avoid direct effects to Indiana bats. Even though removing trees during the specified "unoccupied" period likely avoids direct effects, the proposed project may still have significant indirect and cumulative effects to Indiana bats. To address our concerns relative to the potential indirect and cumulative effects to Indiana bats, we offer the following primary options to ensure that the project is in full compliance with the ESA.

- The project proponent can modify the proposed project to eliminate or reduce impacts to suitable Indiana bat habitat, thus avoiding impacts.

- The project proponent can survey the project site to determine the presence or absence of Indiana bats within the project area in an effort to determine if potential effects are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

- The project proponent can assume presence of the Indiana bat in the proposed project area and mitigate for the impacts of habitat removal on the species by entering into a Conservation Memorandum of Agreement (MOA) with the Service. By entering into an MOA, the Cooperator can gain flexibility in project timing with regard to the removal of suitable Indiana bat habitat and/or avoid the need for surveys or additional analysis. In exchange, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures as set forth in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is sufficient supporting information to concur with the determination.

Northern long-eared bat

The proposed project area is within potential northern long-eared bat summer roost/foraging habitat. The northern long-eared bat is currently proposed for federal listing under the ESA. The entire Commonwealth of Kentucky is considered potential habitat for the northern long-eared bat. During the summer, Northern long-eared bats typically roost singly or in colonies in a wide-variety of forested habitats, where they seek shelter during daylight hours underneath bark or in cavities/crevices of both live trees and snags, including relatively small trees and snags that are less than 5 inches in DBH. Northern long-eared bats have also been documented roosting in man-made structures (i.e., buildings, barns, etc.) during the summer. According to current winter occurrence data, northern long-eared bats predominately winter in hibernacula that include caves, tunnels, and underground mine passages.

Federal action agency(s) for the proposed project are encouraged to voluntarily confer with the Service on any federal action which is likely to jeopardize the continued existence of the northern long-eared bat (ESA, Section 7(a)(4). The conference process is discretionary if the proposed action may affect a proposed species, like the northern long-eared bat. At this time, no designated critical habitat has been proposed for the northern long-eared bat. Although species proposed for listing are not afforded protection under the ESA, when a species is listed, the ESA prohibition under Section 7(a)(2) becomes effective 30 days after the publication of the final rule, regardless of an action's stage of completion.

According to your correspondence, the proposed project would result in the removal of some potential northern long-eared bat summer roost / foraging habitat and the project-associated tree removal is expected to occur during 2015. The final rule to list the northern long bat or not is expected to be published by April 2, 2015. If the project-associated construction activities continue after April, 2015, and the northern long eared bat is listed as threatened or endangered, the federal action agency is required to consult with the Service if it is determined that the proposed project may affect the northern long-eared bat. The Service may recommend additional minimization and mitigation measures to ensure that the proposed project is in full compliance with the ESA relative to the northern long-eared bat. Therefore, to avoid significant project delays, we recommend that you contact our office to identify and resolve potential conflicts regarding the northern long-eared bat in your project area.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jim Gruhala of my staff at (502) 695-0468 extension 116.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

AMERICAN ELECTRIC POWER

American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373
AEP.com

United States Fish and Wildlife Service
Kentucky Ecological Services Field Station
ATTN: Mr. Jim Gruhala
330 West Broadway, Suite 265
Frankfort, Kentucky 40601

February 11, 2015

Subject: **Kentucky Power Company dba American Electric Power - Big Sandy Plant**
FWS 2012-B-0544
Fly Ash Pond Closure Project
Pre-Development Consultation

Mr. Gruhala,

In 2012 and 2014, Kentucky Power Company dba American Electric Power (AEP) submitted correspondence to the U.S. Fish and Wildlife Service (USFWS), Kentucky Ecological Services Field Station describing the proposed closure of the facility's existing fly ash pond. A response letter dated December 12, 2014, was received and identified the federally-listed Indiana bat (*Myotis sodalis*) and the proposed-listed northern long-eared bat (*Myotis septentrionalis*) are the only species that have the potential to occur within the vicinity of the project. USFWS agreed that AEP's proposal of conducting tree clearing within the seasonal timeframe of October 15th-March 31st will likely avoid direct effects to the Indiana bat. However, the USFWS stated the project may have significant indirect and cumulative effects and provided four options that may be implemented to ensure compliance. A copy of the correspondence between AEP and USFWS in 2014 is attached.

Since the beginning of the Project, AEP has sought to avoid and minimize impacts to forested habitat to the extent possible. However, due to the nature of the Project, tree clearing in certain areas cannot be avoided. Where impacts are unavoidable, AEP considered design alternatives that reduced impacts to the extent possible. This avoidance and minimization is depicted with the successively smaller boundaries of planned limits of disturbance that were conceptually designed in April 2013, July 2014, and December 2014, respectively, as depicted on Figure 2 (attached).

Because the nature of the project requires unavoidable clearing of forested habitat, to address the concerns regarding indirect and cumulative effects to the Indiana bat, AEP will assume presence within the project area and mitigate potential impacts of habitat removal by entering into a Conservation Memorandum of Agreement (CMOA) with the USFWS. This approach is also expected to satisfy any necessary indirect or cumulative effects to the northern long-eared bat, should it be listed in the future.

The "polygon method" was used to estimate the total area of clearing impact for the project. Accordingly, the total acreage is approximately 101.1-acres (refer to attached Figure 3). Further, AEP will commit to conducting all project-associated tree removal within the October 15th-March 31st timeframe. As a result, AEP will contribute $159,232.50 to the Indiana Bat Conservation Fund (IBCF) based on a mitigation ratio of 0.5 and the current rate of $3,150/acre. Should the USFWS find this proposal acceptable, AEP requests approval for the proposed tree clearing activities associated with this project.

If you have any questions regarding this information, please contact Jill N. Lukehart of my staff at (614) 716-2209 or at jnlukehart@aep.com

Alan R. Wood, P.E.
Director, Water and Ecological Resource Services
AEP Environmental Services

Attachments:	2014 AEP and USFWS Correspondence Figure 1: Overview Figure Figure 2: Limit of Disturbance Comparison Map Figure 3: Forested Habitat Clearing Map

CULTURAL RESOURCES WALKOVER OF AMERICAN ELECTRIC POWER COMPANY, INC.'S BIG SANDY PLANT POND CLOSURE PROJECT IN LAWRENCE COUNTY, KENTUCKY

Lead Agency: United States Army Corps of Engineers, Louisville District

Contains Privileged Information – Do Not Release

Prepared for:
American Electric Power Company, Inc.

November 2012

525 Vine Street, Suite 1800
Cincinnati, Ohio 45202
Voice (513) 651-3440
Fax (513) 651-3452

AUTHORS:

Crista M. Haag, MA

and

Benjamin S. Goodwin, MA, RPA

PRINCIPAL INVESTIGATOR:

Christopher Bergman, PhD, RPA

ABSTRACT

URS Corporation (URS) was contracted by American Electric Power Company, Incorporated (AEP) to conduct a cultural resources walkover for the proposed Big Sandy Plant Pond Closure Project near Louisa in Lawrence County, Kentucky (the Project). The purpose of this walkover was to evaluate the Project for the probability of encountering archaeological and/or historic resources, and to make recommendations for additional cultural resources work (if needed). The lead federal agency for the Project is the United States Army Corps of Engineers, Louisville District (USACE).

The Area of Potential Effect (APE) will include all areas where ground disturbance associated with the Project will occur. In this instance, the APE consists of approximately 573 acres (232 hectares) contained within the maximum limits of disturbance for the Project. URS recognizes that a smaller area may be impacted within this APE. Because the lead agency for the Project is the USACE, special attention was given to the USACE jurisdictional areas, which consisted of streams, wetlands, vernal pools, and ponds.

Given the results of the background research, which recorded a low number of cultural resources within two kilometers (1.2 miles) of the Project; the large degree of previous disturbance and deflation exhibited within the soils during the walkover; and the incidence of steep slope greater than 15 percent; the APE displays a low probability for containing intact archaeological resources.

As a result, a majority of the APE would not require formal Phase I archaeological survey. In areas with steep slope near USACE jurisdictional areas, a pedestrian survey meeting the KHC guidelines may be conducted to identify any caves, quarries, benches, rock faces, and rock overhangs. If identified, these resources would need to be surveyed per the methodology in Sanders (2006:22). The only level area that would need formal Phase I archaeological survey may be the ridgeline in the eastern portion of the APE near the USACE jurisdictional area. The family cemetery that was identified within the western half of the APE should be avoided.

With regard to the indirect (viewshed) APE, because the Project involves the closure of an existing facility there appears to be no major viewshed concerns. No architectural history survey is therefore recommended. If the scope of the Project changes, the viewshed may need to be re-evaluated for indirect effects.

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TABLES

FIGURES

PLATES

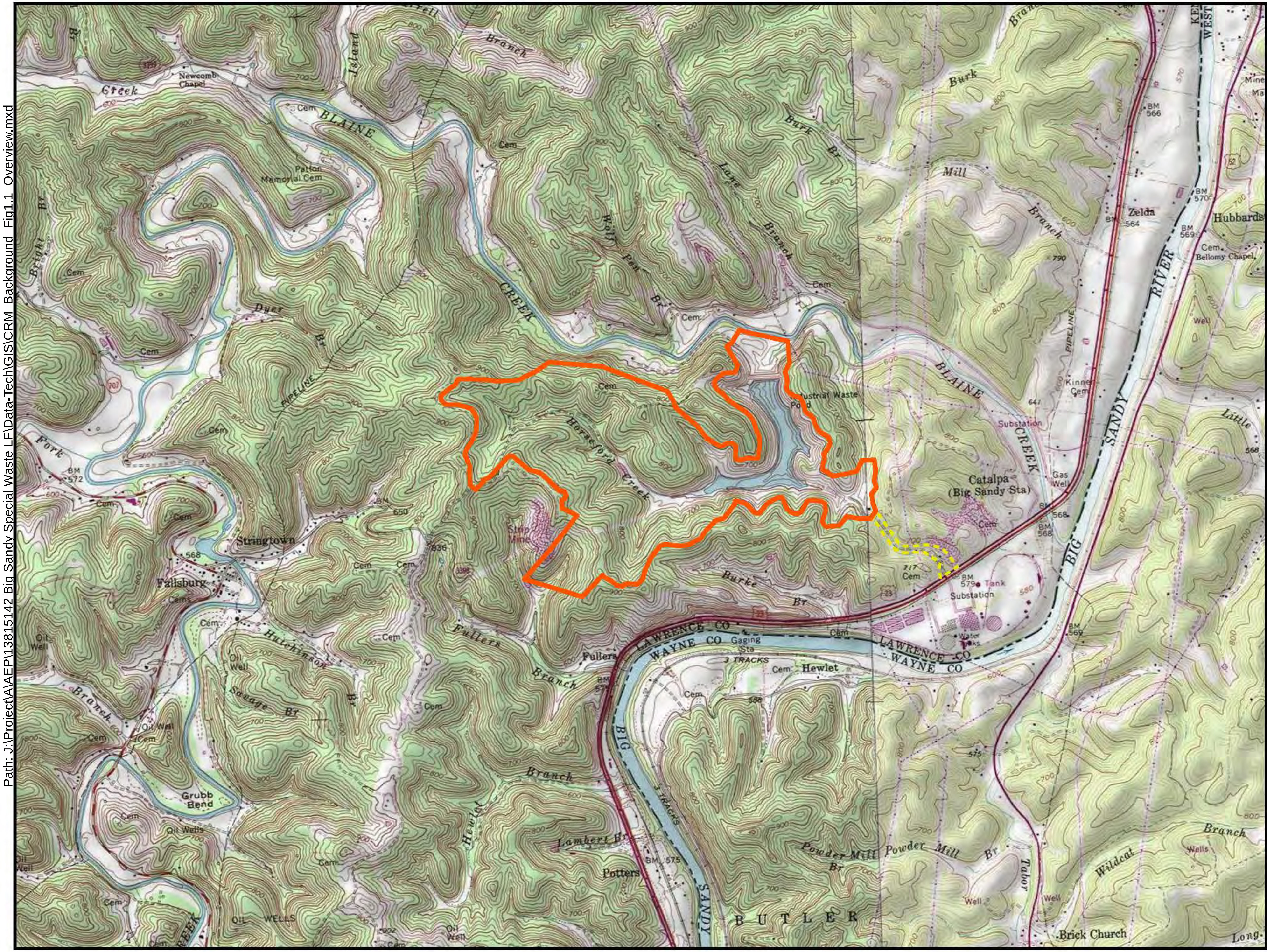
1.0 INTRODUCTION AND PROJECT DESCRIPTION

URS Corporation (URS) was contracted by American Electric Power Company, Incorporated (AEP) to conduct a cultural resources walkover for the proposed Big Sandy Plant Pond Closure project in Lawrence County, Kentucky (the Project). The purpose of this walkover was to evaluate the Project for the probability of encountering archaeological and/or historic resources, and to make recommendations for additional cultural resources work (if needed).

1.1 PROJECT DESCRIPTION AND PROJECT AREA OF POTENTIAL EFFECT

AEP's Kentucky Power Company owns and operates the 1,097 Mega Watt (MW) Big Sandy Plant on the west bank of the Big Sandy River, near Louisa in Lawrence County, Currently, coal combustion fly ash from the plant is disposed of in the Big Sandy Fly Ash reservoir, which is impounded by the Horseford Creek Dam located approximately 0.75 miles northwest of the plant. In expectation of future Federal Regulations pertaining to wet ash impoundments, the Project involves closure design of the Plant's existing 130-acre (53-hectare) wet fly ash impoundment, which will no longer be needed for wet sluice disposal beginning in 2016 (Figure 1.1). In an effort to effectively close the fly ash reservoir in accordance with expected but not-yet-promulgated Federal Regulations for wet CCP impoundments, it is AEP's desire to permanently close the facility by draining and capping the Big Sandy Fly Ash Pond. The lead federal agency for the Project is the United States Army Corps of Engineers, Louisville District (USACE).

The Area of Potential Effect (APE) will include all areas where ground disturbance associated with the Project will occur. In this instance, the APE consists of approximately 573 acres (232 hectares) contained within the maximum limits of disturbance for the Project. Because the lead agency for the Project is the USACE, special attention was given to the USACE jurisdictional areas, which consisted of streams, wetlands, vernal pools, and ponds.



LOCATOR MAP

LEGEND:

🟧 Max Limit of Disturbance

N

0 1,700 3,400

Scale in Feet

0 500 1,000

Scale in Meters

BASE MAP SOURCE:
USGS Topographic Quadrangles:
Fallsburg, KY/WV (1978) and
Prichard, WV/KY (1977)

AEP

Big Sandy Landfill

FIGURE 1.1
OVERVIEW MAP

JOB NO. 13815142

URS

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\CRM_Background_Fig1.1_Overview.mxd

2.0 BACKGROUND RESEARCH

URS conducted background research in March 2012 utilizing the electronic GIS shapefiles from the Office of the State Archaeologist (OSA) in Lexington, and the Kentucky Heritage Council (KHC) in Frankfort, to locate any previously recorded cultural resources within a two-kilometer (1.2-mile) radius of the APE (referred to as the Archival Study Area, for ease of reference). This research was conducted with the primary goal of identifying any cultural resources that were previously defined within or adjacent to the APE for the Project.

As a result of the background research, only eight archaeological sites were identified within the Archival Study Area, none of which occur within the APE. One cemetery was also documented within the APE after an examination of topographic mapping.

Table 2.1 lists the archaeological sites documented within the Archival Study Area. Of these eight archaeological sites, all are located on the floodplain or on a terrace of Blaine Creek to the north of the Project. All of these resources are documented as unassigned prehistoric locales.

Table 2.1. Previous Archaeological Sites within the Archival Study Area

Site Number	Temporal Period	Site Type	NRHP Status
15La80	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La81	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La82	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La83	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La84	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La85	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La86	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La87	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded
15La88	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded

3.0 WALKOVER FIELD METHODS AND RESULTS

3.1 FIELD METHODS

URS conducted a cultural resources walkover of the APE in March 2012 and October 2012. The March 2012 visit focused on the western portion of the APE, while the October 2012 visit focused on the eastern portion of the APE.

The cultural resources walkover involved photo documentation of the APE, including general views of the surrounding landscape, in addition to visible above-ground cultural features, obvious disturbance, steep slope, etc. In addition to photography, URS, when possible, excavated shovel probes to verify the presence of intact soils and/or disturbance.

Shovel probes were excavated in accordance with the KHC guidelines entitled, *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (Sanders 2006). A 20-meter interval was utilized, and minimally 30 centimeter in diameter holes were excavated to archaeologically sterile soil or to 50 centimeters below the surface. Excavated soils were screened through ¼ inch wire mesh and examined for evidence of cultural materials. Profiles were described for each shovel probe and notes were recorded concerning the soil stratigraphy (including Munsell color designations and texture) and any cultural resources encountered. All shovel probes were assigned a unique designation that was then mapped with sub-meter accurate GPS equipment. During fieldwork, Sample Loci (SL) forms were completed by URS personnel.

3.2 MARCH 2012 FIELD RESULTS

The walkover for the western portion of the APE was conducted on March 22 and 23, 2012, by URS staff archaeologist Benjamin S. Goodwin, MA, RPA. This area was also revisited by Mr. Goodwin in October 2012. Within the APE there is an existing fly ash pond surrounded by steep wooded slopes with some level areas on the outer portions of the APE (Plates 3.1 and 3.2). An existing access road extends around the entire fly ash facility that corresponds roughly to the APE boundary (Plate 3.3). A total of 42 SL were examined during the walkover of this western portion of the APE, 27 of which were excavated as shovel probes, and these are summarized in Table 3.1 (see Figures 3.1 and 3.2 for walkover results).

BASE MAP SOURCE:
USGS Topographic Quadrangles:
Fallsburg, KY/WV (1978) and
Prichard, WV/KY (1977)

AEP

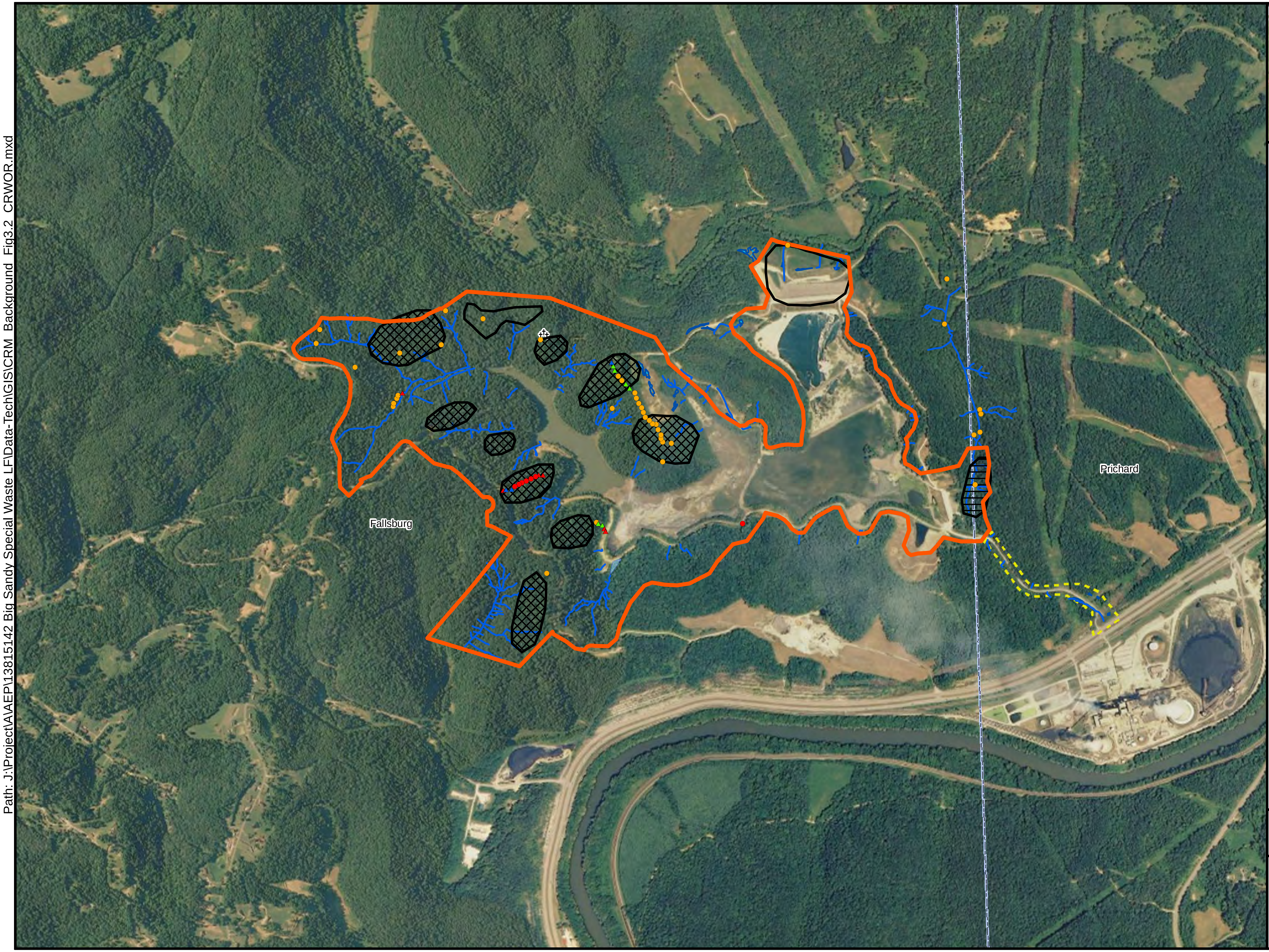
Big Sandy Landfill

FIGURE 3.1
CULTURAL RESOURCES
WALKOVER RESULTS

JOB NO. 13815142

URS

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\CRM Background Fig3.1 CRWOR.mxd



LEGEND:

- ▲ Ped, Disturbed
- ▲ Ped, Slope
- ▲ Ped, Wet
- ● ST
- ● ST, Disturbed
- ✝✝ Cemetery
- ☐ Max Limit of Disturbance
- ▨ Deflated
- ☐ Disturbed Road Cut
- ▤ Requires Survey
- — Streams
- ▨ Wetland
- ■ Vernal Pool
- ■ Pond
- ☐ Topographic Quadrangle

N

0 1,200 2,400
Scale in Feet

0 370 740
Scale in Meters

BASE MAP SOURCE:
National Agriculture
Imagery Program, 2010

AEP

Big Sandy Landfill

FIGURE 3.2
CULTURAL RESOURCES
WALKOVER RESULTS

JOB NO. 13815142

URS

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\CRM_Background_Fig3.2_CRWOR.mxd

Plate 3.1. Example of Existing Fly Ash Pond.

Plate 3.2. Example of Wooded Slopes.

Plate 3.3. Example of Existing Access Road.

Table 3.1. Summary of SL Data in Western Portion of APE

SL Type	SL Count (n=)
Pedestrian, Disturbed	6
Pedestrian, Slope	6
Pedestrian, Wet	3
Shovel Probe, Disturbed	7
Shovel Probe, Negative	20
Total	**42**

Large portions of the level areas surrounding the existing ash pond are either deflated or disturbed (Plates 3.4 and 3.5). Deflated soil profiles, such as SL 7, revealed a brown (10YR 4/3) silt loam to a depth of 15 centimeters below ground surface, with an underlying very pale brown (10YR 7/4) clay mottled with brownish yellow (10YR 6/6) clay B horizon soil. No cultural materials were recovered from the 27 excavated shovel probes.

Plate 3.4. Example of Deflated Soils.

Plate 3.5. Example of Disturbed Soils.

One family cemetery was documented within the western portion of the APE (see Figure 3.1 and 3.2). This cemetery appears to be maintained, and consists of 21 marked graves dating from 1918 to 2010 (Plates 3.6 and 3.7). Family names in the cemetery include Elkins, Jones, McDaniel, Samson, and Thompson.

Plate 3.6. Overview of Cemetery.

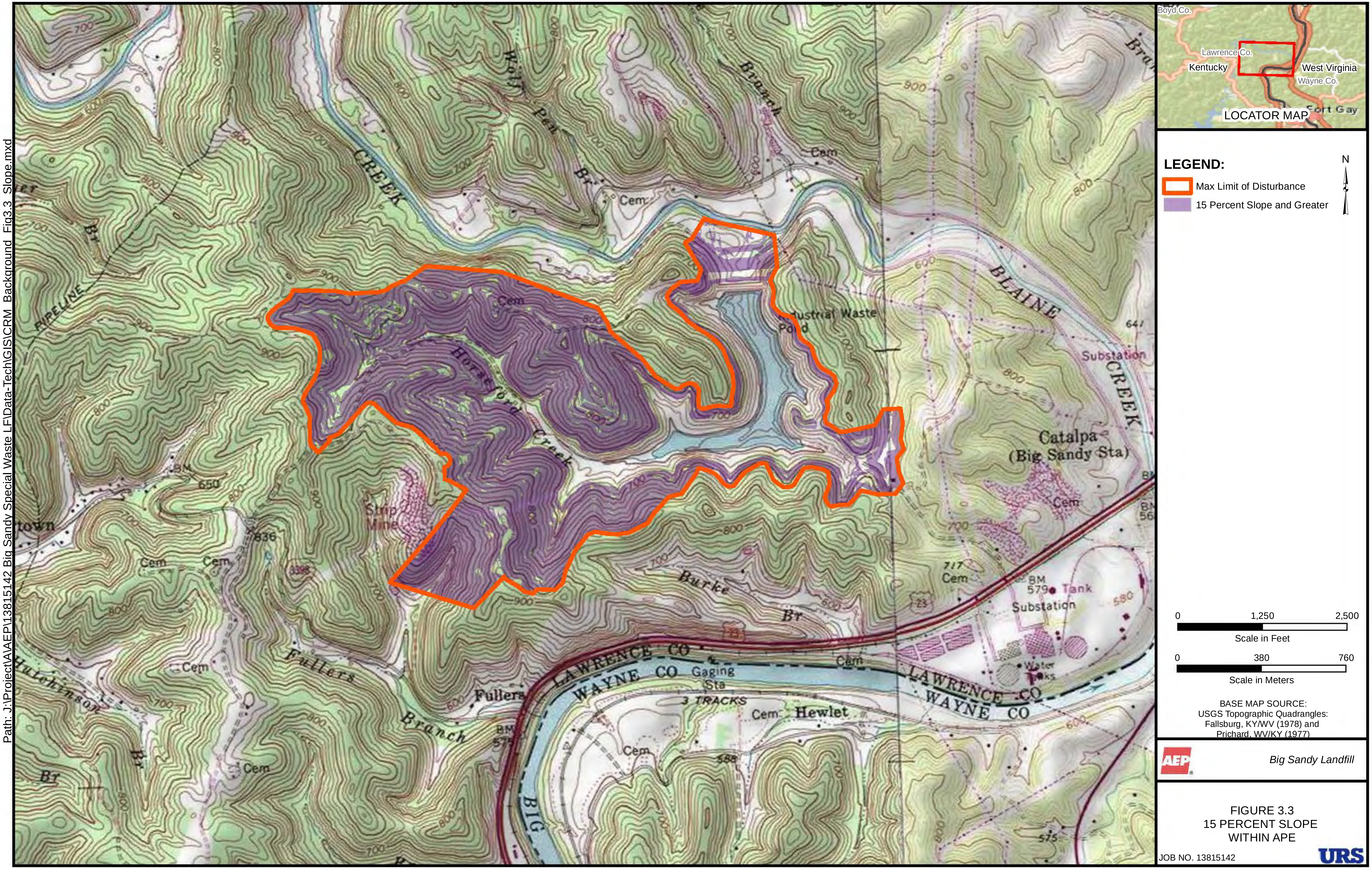
Plate 3.7. Oldest Grave Identified at Cemetery.

Figure 3.3 illustrates areas within the APE that contain slope greater than 15 percent (encompassing most of the APE), and do not require formal Phase I cultural resources survey according to KHC guidelines (Sanders 2006). Sanders (2006:22) does suggest, however, that steeply sloped areas would still need a visual inspection to look for caves, quarries, benches, rock faces, and rock overhangs. During the cultural resources walkover of the western portion of the APE in October 2012, URS did identify one possible rock overhang at the very western end of the APE (Plate 3.8).

Plate 3.8. Example of a Rock Overhang.

3.3 OCTOBER 2012 FIELD RESULTS

The walkover for the eastern portion of the APE was conducted on October 15 and 16, 2012, also by Mr. Goodwin. Similar to the western portion, the eastern APE contains an existing fly ash pond surrounded by steep wooded slopes (Plate 3.9). In the northern portion of this section near Blaine Creek is an existing dam (Plate 3.10). A total of two shovel tests were excavated in level areas during the walkover of this eastern portion of the APE, and these are summarized in Table 3.2 (see Figures 3.1 and 3.2 for walkover results).



LEGEND:

🟧 Max Limit of Disturbance

🟪 15 Percent Slope and Greater

0 1,250 2,500
Scale in Feet

0 380 760
Scale in Meters

BASE MAP SOURCE:
USGS Topographic Quadrangles:
Fallsburg, KY/WV (1978) and
Prichard, WV/KY (1977)

AEP

Big Sandy Landfill

FIGURE 3.3
15 PERCENT SLOPE
WITHIN APE

JOB NO. 13815142

URS

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\CRM_Background_Fig3.3_Slope.mxd

Plate 3.9. Overview of the Eastern Portion of the APE.

Plate 3.10. Overview of the Dam within the APE (photo taken north of the dam).

Table 3.2. Summary of SL Data in Eastern Portion of APE

SL Type	SL Count (n=)
Shovel Probe, Disturbed	1
Shovel Probe, Negative	1
Total	**2**

Selected shovel probes were placed within the APE just north of the dam and within the easternmost portion of the APE along a ridgeline. Soil profiles north of the dam indicate that this portion of the APE is disturbed, most likely as a result of dam construction (Plate 3.11). Soils consisted of a yellowish brown (10YR 5/8) and grayish brown (10YR 5/2) silt clay loam. These disturbed soils are consistent with the web soil survey (2012) that classifies this area as Dm (dumps, mine, tailings, and tipple).

Plate 3.11. Overview of the APE just north of the Dam.

The easternmost portion of the APE is located along a level ridgeline. Soils were shallow, consisting of a 12 centimeter thick dark yellowish brown (10YR 4/4) silt clay loam, underlain by a grayish brown (10YR 5/2) and brownish yellow (10YR 6/8) clay (Plate 3.12). No cultural materials were recovered from the shovel probes.

Plate 3.12. Overview of the APE within the level ridgeline.

Similar to the western portion of the APE, the eastern portion also contained large areas of slope greater than 15 percent slope (Figure 3.3), which do not require formal Phase I cultural resources survey according to KHC guidelines (Sanders 2006). Sanders (2006:22) does suggest however, that steeply sloped areas would still need a visual inspection to look for caves, quarries, benches, rock faces, and rock overhangs. During the cultural resources walkover of the eastern portion of the APE in October 2012, URS did not identify any caves, quarries, benches, rock faces, and rock overhangs.

4.0 SUMMARY AND RECOMMENDATIONS

URS was contracted by AEP to conduct a cultural resources walkover for the Project. The purpose of this walkover was to evaluate the Project for the probability of encountering archaeological and/or historic resources, and to make recommendations for additional cultural resources work (if needed).

The Project is located approximately 4.5 miles (7.2 kilometers) north and northwest of Louisa, Kentucky, within an existing fly ash disposal area that is used for the nearby AEP Big Sandy Power Generating Facility. In an effort to effectively close the fly ash reservoir in accordance with expected but not-yet-promulgated Federal Regulations for wet CCP impoundments, it is AEP's desire to permanently close the facility by draining and capping the Big Sandy Fly Ash Pond.

As a result of the archival research conducted in March 2012, eight archaeological sites were identified within two kilometers (1.2 miles) of the Project. Of these eight archaeological sites, most of these sites are associated with Blaine Creek to the north and are documented as unassigned prehistoric locales in floodplain or terrace settings. No historic structures or NRHP listings were previously recorded within two kilometers (1.2 miles) of the Project. One cemetery was noted within the APE from topographic mapping.

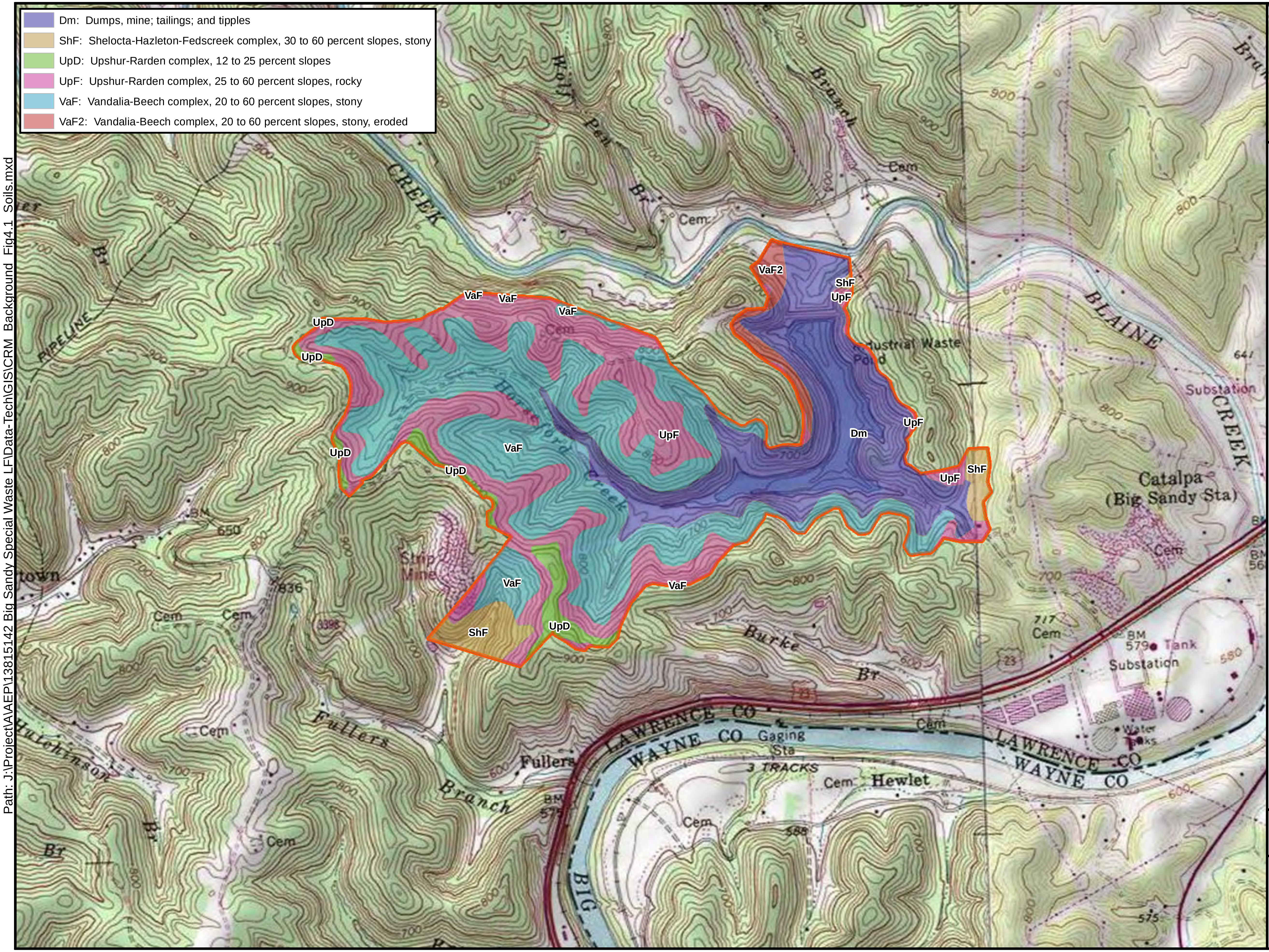
The cultural resources walkover, which was conducted in March and October 2012, indicates that large portions of the APE have been disturbed by existing facilities such as the ash pond and dam. In addition to this previous disturbance, the APE contains mostly 15 percent or greater slopes (Figure 3.3). The few level areas within the APE, especially within the western half, are either disturbed or deflated. Within the eastern half of the APE, disturbance also occurs on the floodplain north of the dam. The only portion that does not appear disturbed is the easternmost portion of the APE along a ridgeline (Figures 3.1 and 3.2).

Given the results of the background research which recorded a low number of cultural resources within two kilometers (1.2 miles) of the Project; the large degree of previous disturbance and deflation exhibited within the soils during the walkover (Figure 4.1); and that most of the APE contains slope greater than 15 percent (please reference Figure 4.1); the APE displays a low probability for containing cultural resources.

As a result, a majority of the APE would not require formal Phase I archaeological survey. In areas with steep slope near USACE jurisdictional areas, a pedestrian survey meeting the

KHC guidelines may need to be conducted to identify any caves, quarries, benches, rock faces, and rock overhangs. If identified, these resources would need to be surveyed per the methodology in Sanders (2006:22). The only level area that may need formal Phase I archaeological survey would be the small portion of ridgeline in the eastern portion of the APE, located within a USACE jurisdictional area. The family cemetery that was identified within the western half of the APE should be avoided.

Because the Project involves the closure of an existing facility, there appears to be no major viewshed concerns. No architectural history survey is recommended. If the scope of the Project changes, the viewshed may need to be re-evaluated for indirect effects.



LOCATOR MAP

LEGEND:

▭ Max Limit of Disturbance

N

0 1,200 2,400
Scale in Feet

0 370 740
Scale in Meters

BASE MAP SOURCE:
USGS Topographic Quadrangles:
Fallsburg, KY/WV (1978) and
Prichard, WV/KY (1977)

AEP®

Big Sandy Landfill

FIGURE 4.1
SOILS WITHIN THE APE

JOB NO. 13815142

URS

Path: J:\Project\A\AEP\13815142 Big Sandy Special Waste LF\Data-Tech\GIS\CRM Background Fig4.1 Soils.mxd

5.0 REFERENCES

Sanders, Thomas N. (editor)
2006 *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports*. Kentucky Heritage Council, Frankfort, KY.

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2012 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed [11/13/2012].