

APPENDIX C

ENVIRONMENTAL ASSESSMENT SUPPORTING DOCUMENTATION

APPENDIX C

ENVIRONMENTAL ASSESSMENT SUPPORTING DOCUMENTATION

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2. Wetland Delineation Report
3. Botanical Survey/Vegetation Data
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Maps and Site Photographs

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Plan Map

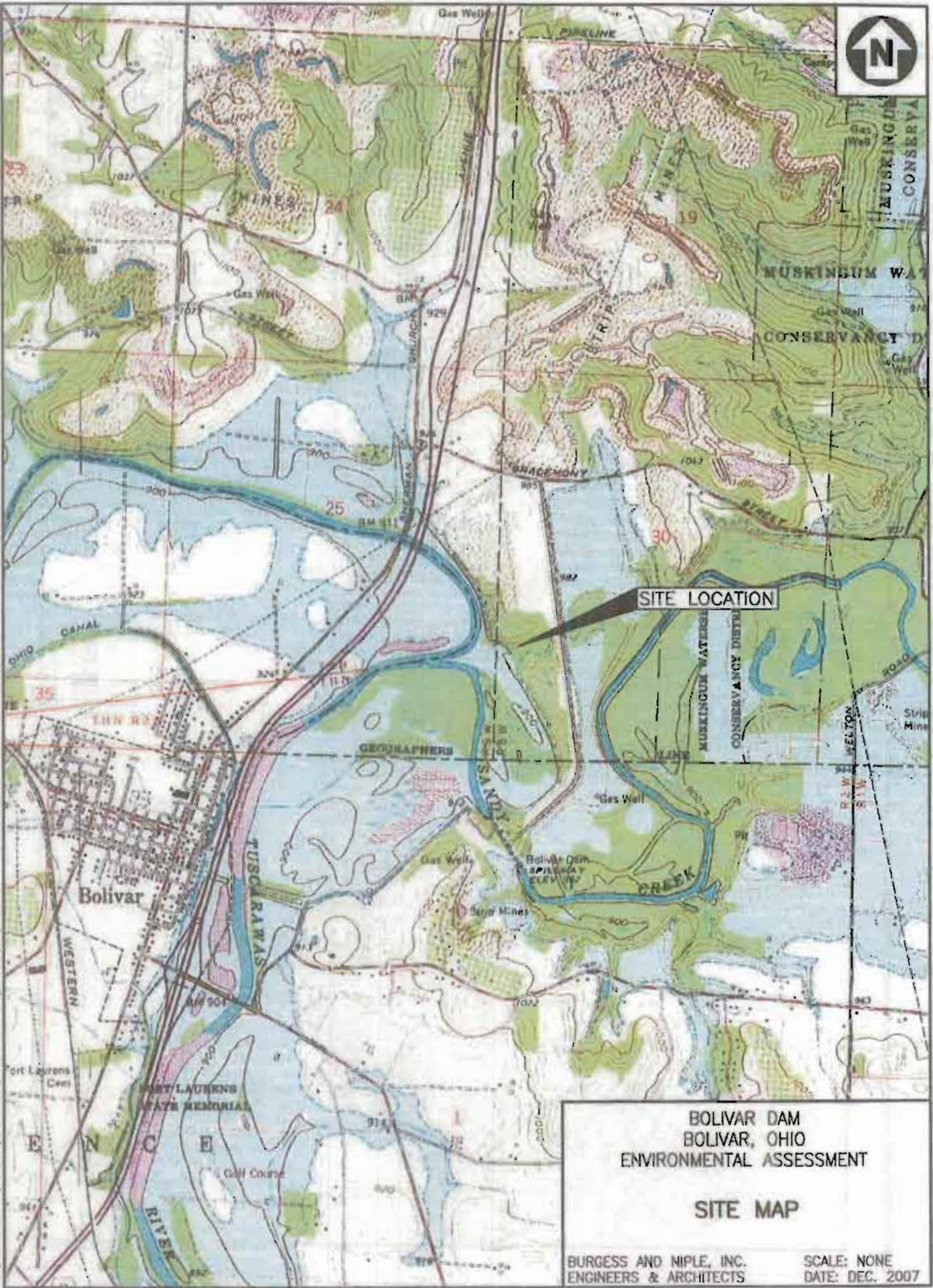
NWI Map

FEMA Map

USDA Soils Map

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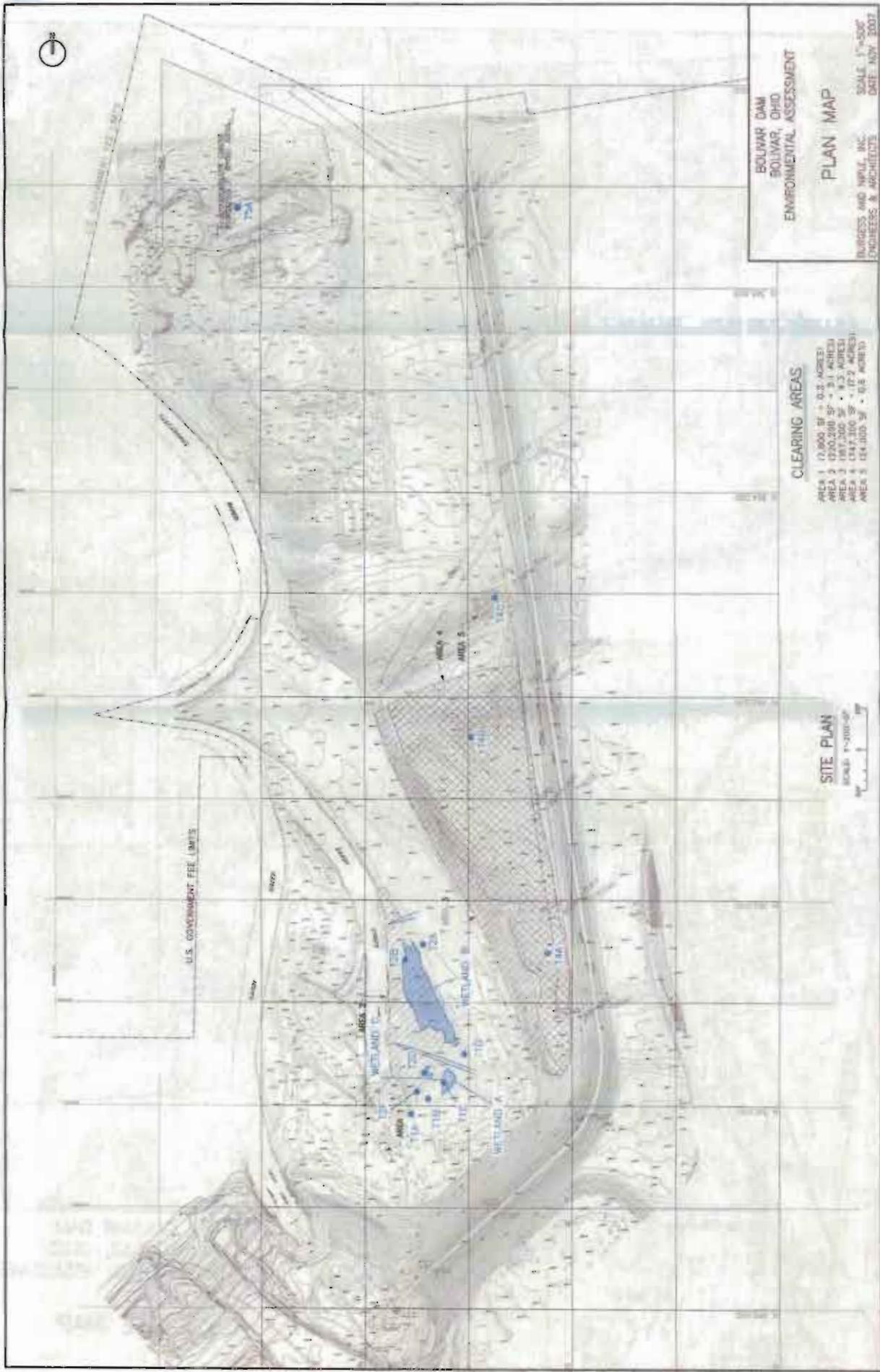
SITE LOCATION

BOLIVAR DAM
BOLIVAR, OHIO
ENVIRONMENTAL ASSESSMENT

SITE MAP

BURGESS AND NIPLE, INC.
ENGINEERS & ARCHITECTS

SCALE: NONE
DATE: DEC. 2007



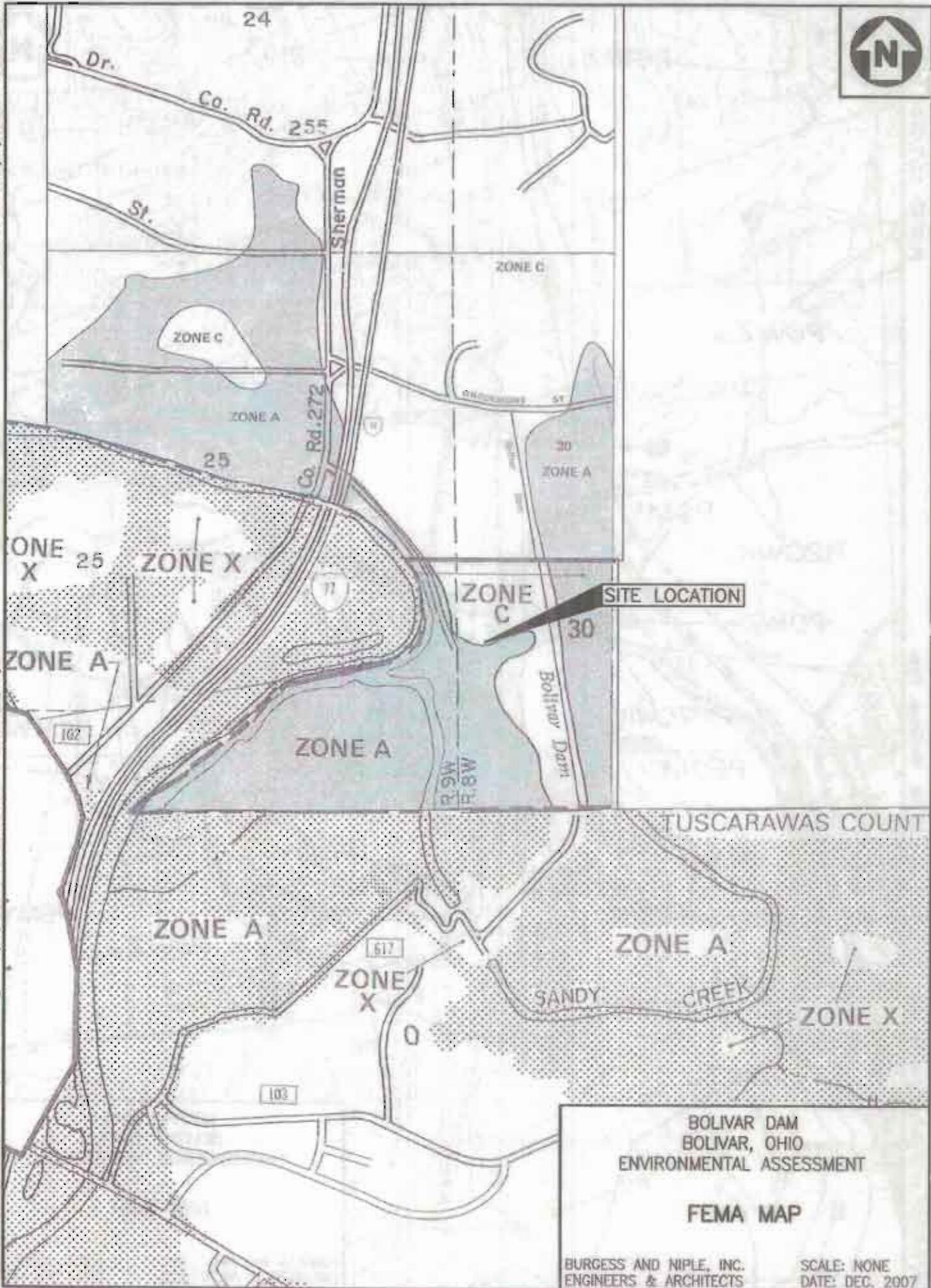
BOLIVAR DAM
BOLIVAR, OHIO
ENVIRONMENTAL ASSESSMENT
PLAN MAP
 BURGESS AND NIPLE, INC.
 ENGINEERS & ARCHITECTS
 SCALE: 1"=300'
 DATE: NOV. 2007

CLEARING AREAS
 AREA 1 17,000 SF = 0.2 ACRES
 AREA 2 670,000 SF = 3.1 ACRES
 AREA 3 187,000 SF = 0.9 ACRES
 AREA 4 144,000 SF = 0.7 ACRES
 AREA 5 124,000 SF = 0.6 ACRES

SITE PLAN
 SCALE: 1"=300'-0"
 0' 100' 200'

PLOTTED: 12/7/2007 1:14:35 PM

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BOLIVAR DAM
 BOLIVAR, OHIO
 ENVIRONMENTAL ASSESSMENT

FEMA MAP

BURGESS AND NIPLÉ, INC.
 ENGINEERS & ARCHITECTS

SCALE: NONE
 DATE: DEC. 2007

Soil Map—Stark County, Ohio, and Tuscarawas County, Ohio



MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 17N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Stark County, Ohio
 Survey Area Data: Version 5, Sep 7, 2007
 Soil Survey Area: Tuscarawas County, Ohio
 Survey Area Data: Version 8, Sep 13, 2007

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 4/14/1994; 4/21/1994; 4/23/1994

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

MAP LEGEND

- | | |
|------------------------|------------------------------|
| Area of Interest (AOI) | Very Stony Spot |
| Soils | Wet Spot |
| Soil Map Units | Other |
| Special Point Features | Special Line Features |
| Blowout | Gully |
| Borrow Pit | Short Steep Slope |
| Clay Spot | Other |
| Closed Depression | Political Features |
| Gravel Pit | Municipalities |
| Gravelly Spot | Cities |
| Landfill | Urban Areas |
| Lava Flow | Water Features |
| Marsh | Coasts |
| Mine or Quarry | Streams and Canals |
| Miscellaneous Water | Transportation |
| Potential Water | Rails |
| Rock Outcrop | Roads |
| Saline Spot | Interstate Highways |
| Sandy Spot | US Routes |
| Severely Eroded Spot | State Highways |
| Sinkhole | Local Roads |
| Slide or Slip | Other Roads |
| Sodic Spot | |
| Spoil Area | |
| Stony Spot | |

Map Unit Legend

Stark County, Ohio (OH151)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CcD	Conotton gravelly loam, 15 to 25 percent slopes	14.3	6.0%
Ck	Chagrin loam, alkaline phase	4.2	1.8%
Cm	Chagrin silt loam, alkaline phase	27.9	11.7%
CnA	Chill loam, 0 to 2 percent slopes	12.0	5.0%
CnB	Chill loam, 2 to 6 percent slopes	7.5	3.1%
CoC	Chill gravelly loam, 6 to 12 percent slopes	5.5	2.3%
CoD2	Chill gravelly loam, 12 to 18 percent slopes, moderately eroded	8.7	3.6%
CyB	Conotton gravelly loam, 2 to 6 percent slopes	6.3	2.7%
CyC	Conotton gravelly loam, 6 to 12 percent slopes	2.5	1.0%
CyD2	Conotton gravelly loam, 12 to 18 percent slopes, moderately eroded	6.2	2.6%
FcB	Fitchville silt loam, 2 to 6 percent slopes	0.0	0.0%
Le	Lobdell silt loam, alkaline phase	1.0	0.4%
Mc	Melvin silt loam, frequently flooded	3.9	1.6%
Pg	Pits, gravel	43.6	18.3%
PIB	Plainfield loamy sand, 0 to 6 percent slopes	2.2	0.9%
PIC	Plainfield loamy sand, 6 to 12 percent slopes	7.6	3.2%
Sh	Shoals silt loam	1.5	0.7%
SiD	Strip mine spoil, nonacid materials, rolling	0.0	0.0%
Ua	Udorthents	1.8	0.8%
Ub	Udorthents, hilly	10.1	4.2%
W	Water	10.2	4.3%
Wd	Wayland silt loam	7.3	3.0%
WmA	Wheeling loam, 0 to 2 percent slopes	7.4	3.1%
WmB	Wheeling loam, 2 to 6 percent slopes	4.0	1.7%
WoA	Wheeling loam, 0 to 3 percent slopes	0.0	0.0%

Tuscarawas County, Ohio (OH157)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cg	Chagrin silt loam, alkaline phase	1.8	0.7%
CmA	Chili silt loam, 0 to 3 percent slopes	0.2	0.1%
CoD	Conotton gravelly loam, 15 to 25 percent slopes	2.1	0.9%
Mc	Melvin silt loam, frequently flooded	2.9	1.2%
Ua	Udothents, hilly	32.2	13.6%
W	Water	2.9	1.2%
Totals for Area of Interest (AOI)		237.8	100.0%

15A	15A	15A	15A
15B	15B	15B	15B
15C	15C	15C	15C
15D	15D	15D	15D
15E	15E	15E	15E
15F	15F	15F	15F
15G	15G	15G	15G
15H	15H	15H	15H
15I	15I	15I	15I
15J	15J	15J	15J
15K	15K	15K	15K
15L	15L	15L	15L
15M	15M	15M	15M
15N	15N	15N	15N
15O	15O	15O	15O
15P	15P	15P	15P
15Q	15Q	15Q	15Q
15R	15R	15R	15R
15S	15S	15S	15S
15T	15T	15T	15T
15U	15U	15U	15U
15V	15V	15V	15V
15W	15W	15W	15W
15X	15X	15X	15X
15Y	15Y	15Y	15Y
15Z	15Z	15Z	15Z

Farmland Classification

Farmland Classification— Summary by Map Unit — Stark County, Ohio				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CcD	Conotton gravelly loam, 15 to 25 percent slopes	Farmland of local importance	14.3	7.0%
Ck	Chagrin loam, alkaline phase	All areas are prime farmland	3.9	1.9%
Cm	Chagrin silt loam, alkaline phase	All areas are prime farmland	25.8	12.7%
CnA	Chili loam, 0 to 2 percent slopes	All areas are prime farmland	11.7	5.8%
CnB	Chili loam, 2 to 6 percent slopes	All areas are prime farmland	5.3	2.6%
CoD2	Chili gravelly loam, 12 to 18 percent slopes, moderately eroded	Not prime farmland	8.8	4.3%
CyB	Conotton gravelly loam, 2 to 6 percent slopes	Not prime farmland	6.3	3.1%
CyC	Conotton gravelly loam, 6 to 12 percent slopes	Not prime farmland	2.5	1.2%
CyD2	Conotton gravelly loam, 12 to 18 percent slopes, moderately eroded	Not prime farmland	3.3	1.6%
FcB	Fitchville silt loam, 2 to 6 percent slopes	Prime farmland if drained	0.0	0.0%
Mc	Melvin silt loam, frequently flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	3.9	1.9%
Pg	Pits, gravel	Not prime farmland	42.2	20.8%
PIB	Plainfield loamy sand, 0 to 6 percent slopes	Not prime farmland	2.0	1.0%
PIC	Plainfield loamy sand, 6 to 12 percent slopes	Not prime farmland	7.1	3.5%
Sh	Shoals silt loam	Prime farmland if drained	0.0	0.0%
Ua	Udorthents	Not prime farmland	1.3	0.7%
Ub	Udorthents, hilly	Not prime farmland	11.1	5.5%
W	Water	Not prime farmland	8.9	4.4%
Wd	Wayland silt loam	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	7.3	3.6%

Farmland Classification— Summary by Map Unit — Stark County, Ohio				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WmA	Wheeling loam, 0 to 2 percent slopes	All areas are prime farmland	7.4	3.6%
WmB	Wheeling loam, 2 to 6 percent slopes	All areas are prime farmland	4.0	2.0%
Farmland Classification— Summary by Map Unit — Tuscarawas County, Ohio				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cg	Chagrin silt loam, alkaline phase	All areas are prime farmland	1.6	0.8%
CoD	Conotton gravelly loam, 15 to 25 percent slopes	Farmland of local importance	2.0	1.0%
Mc	Melvin silt loam, frequently flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	2.9	1.4%
Ua	Udorhents, hilly	Not prime farmland	18.8	9.2%
W	Water	Not prime farmland	0.8	0.4%
Totals for Area of Interest (AOI)			203.3	100.0%

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower



Spoil area vegetation, Sumac in foreground, Queen Anne's Lace and Goldenrod in background.



Spoil are vegetation.



Spoil area vegetation.



Extremely tall Common Mullein.



Overview of spoil area.



Area 5 vegetation.



Area 3 vegetation.



Area 4 vegetation, White Pines.



Looking at Area 3, facing east.



Area 2 on left, Area 3 on right.



Drainage channel.



Area 1 and 2, looking southwest.



Toe of slope, base of dam. Area 1 on left.



Woodpecker holes.

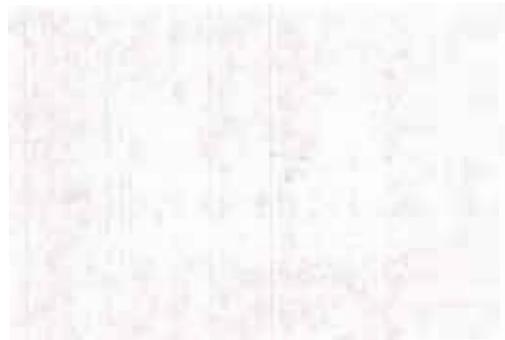


Crayfish stacks.



Overview of tree removal area.

Wetland Delineation Report



Wetlands Delineation

Bolivar Dam
Bolivar, Ohio

Prepared For:
U.S. Army Corps of Engineers



November 2006

WETLANDS DELINEATION

**BOLIVAR DAM
BOLIVAR, OHIO**

**PREPARED FOR
U.S. ARMY CORPS OF ENGINEERS**

NOVEMBER 2006

PREPARED BY

**BURGESS & NIPLE, INC.
Engineers and Architects
5085 Reed Road
Columbus, Ohio 43220**

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1.0 INTRODUCTION

Burgess & Niple, Inc. (B&N) has conducted a jurisdictional evaluation for "waters of the U.S.," including wetlands for the Bolivar Dam located in Bolivar, Tuscarawas County, Ohio. The site is located approximately 0.6-mile east of Interstate 77 and the town of Bolivar, Ohio. The purpose of the site investigation of the property was to determine if wetlands, watercourses or bodies of water are present on the subject property, and, if found, to obtain their accurate size, shape, and location. The information obtained will facilitate in establishing if wetlands or other water bodies would fall under the jurisdiction of the U.S. Army Corps of Engineers (USACE), Ohio Environmental Protection Agency (EPA), or both agencies.

Photographs documenting site conditions at the time of fieldwork are included in **Appendix A**. Global Positioning System (GPS) technology was used to locate sample plots and delineated wetland boundaries. **Appendix B** includes a delineation map showing the location of all sample plots, transects, and jurisdictional areas.

2.0 METHODS

Elements of the investigation included a wetland determination and delineation consisting of a site inspection, delineation of wetland boundaries, current and historical document review, and submittal of report, which discusses the property's specific characteristics, including any wetland areas if encountered. The wetland delineation was performed in accordance with the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, January 1987* (1987 Manual). The determination of any wetlands depends on three basic parameters. These parameters include: (1) the presence of hydrophytic vegetation, (2) the presence of hydric soils, and (3) the presence of wetland hydrology. The above parameters are virtually always interrelated and present in wetland systems. Specifically, the wetland determination and delineation included the following services:

- Perform a background documentation review that includes National Wetland Inventory (NWI) Map Review, Flood Insurance Rate Maps (FIRM) Floodplain Maps, Aerial Photography Review, U.S. Geological Survey (USGS) Topographic Map Review, and Tuscarawas County and Stark County Soil Survey Reviews.
- Perform a Site Reconnaissance that evaluates specific site characteristics and features.
- Establish transects and representative sample plot locations for field data collection. Sample plot locations were flagged in the field. Within each plot, a description of the soil profile was recorded, along with indicators of wetland hydrology. Vegetation was identified by layer, including trees and woody vines within 30 feet and herbaceous plants/saplings/shrubs within 5 feet of the flagged sampling point. The data on vegetation, soils, and hydrology collected at each of the sample plots were used to complete the data sheets.
- Delineate the boundaries of the existing wetland areas using GPS technology, which provides the size, shape, and location of the wetland(s) on the subject property.
- Preparation and submittal of this report summarizing the findings of the above described tasks, evaluating the wetland characteristics, and determining the wetland regulation(s) which may or may not apply to the wetland present on the subject property.

3.0 SITE LOCATION

The area investigated during this study is located at the bottom of the Bolivar Dam, Bolivar, Tuscarawas County, Ohio. The study area extends slightly into Stark County. **Appendix C** identifies the area of investigation on the USGS 7.5-minute topographic map for Bolivar, Ohio.

3.1 Site Description

The area investigated is at the base of Bolivar Dam, a dam on Sandy Creek, a tributary of the Tuscarawas River. The dam is a "dry" dam, intended to prevent flooding by reducing flow rates in the Sandy Creek during and immediately following precipitation. The area of investigation has recently been subject to seepage of water from under the dam called "boils." These boils occur when water levels behind the dam are high and provide pressures significant enough to push water through soils under the dam and emerge from the other side.

3.2 Agency Resource Information

3.2.1 USGS Topographic Quadrangle

A copy of the USGS 7.5-minute series topographic quadrangle for Bolivar, Ohio was reviewed for background information related to the study area. According to the quadrangle, the site is depicted as land occurring at the base of the Bolivar Dam. The quadrangle shows the area as a flat mosaic of forest and field occurring between the dam and the downstream portion of Sandy Creek. According to the map, the elevation at the site is around 900 feet above mean sea level (amsl). There are no wetlands depicted on the quadrangle.

A copy of the USGS map excerpt covering the site is included in **Appendix C**.

3.2.2 National Wetlands Inventory (NWI) Maps

NWI maps are compiled by the U.S. Department of the Interior, Fish & Wildlife Service. These maps outline existing wetlands and deepwater habitats on individual USGS topographic maps. NWI maps are prepared by stereoscopic analysis of high altitude aerial photographs. The aerial photographs typically reflect conditions during the specific year and season when they were taken. Because small wetlands and those hidden by dense forest cover may not be represented on these maps, NWI maps

cannot be used as the sole method of determining the presence or absence of jurisdictional wetlands on a site.

A review of the NWI map covering the subject property revealed one palustrine open water wetland, intermittently exposed to permanently flooded (POWZ) wetland. This wetland is situated immediately adjacent to the site, forming one of the boundaries.

A copy of the NWI map for the site is included as **Appendix D**.

3.2.3 Flood Insurance Rate Map (FIRM)

FIRMs are produced by the Federal Emergency Management Agency (FEMA). These maps show areas at risk from 100- and 500-year floods. According to the FIRMs covering the site, the site lies in an area at risk to inundation from 100-year floods.

A copy of the FIRM for the site is included as **Appendix E**.

3.2.4 Aerial Photograph

A 2004 aerial photograph for the site was obtained. The large wetland forming the western site boundary is depicted along with a ditch separating two forested stands. There are no indications of wetlands on the site.

A copy of the aerial photograph is included as **Appendix F**.

3.3 Soil Survey Information

The *Soil Survey of Tuscarawas County, Ohio*¹ and *Soil Survey of Stark County, Ohio*² depicts four soil map units within the project area. Relevant information for the mapped soil types is included below.

¹ Waters, D.D. and L.E. Roth. 1986. *Soil Survey of Tuscarawas County, Ohio*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Ohio Department of Natural Resources, Division of Land and Soil, and the Ohio Agricultural Research and Development Center.

² Christman, R.L., D.D. Waters, and J.R. Bauder. 1971. *Soil Survey of Stark County, Ohio*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Ohio Department of Natural Resources, Division of Land and Soil, and the Ohio Agricultural Research and Development Center.

- **Wayland silt loam (Wd)** – A nearly level, very deep, poorly drained soil. Typically, the surface layer is silt loam about 2 inches thick. The surface layer has a high content of organic matter. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. The soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 3 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is hydric.
- **Melvin silt loam, frequently flooded (Mc)** – A nearly level, very deep, poorly drained soil. Typically the surface layer is silt loam about 12 inches thick. The surface layer has a moderately low content of organic matter. The slow permeability is moderate. It has a very high available water capacity and a low shrink swell potential. The soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is hydric.
- **Udorthents, hilly (Ua)** – No description available for Udorthents.

Two of the mapped soil units are listed as hydric soils - Wayland silt loam and Melvin silt loam, frequently flooded. A copy of the soils map for the site area is included as **Appendix G**.

4.0 RESULTS

Current criteria require positive indicators of hydrophytic vegetation, wetland hydrology, and hydric soils for an area to be considered a jurisdictional wetland. Three areas totaling 1.92 acres were delineated within the study area. Data sheets are included in **Appendix H**. Ohio Rapid Assessment Method (ORAM) score sheets are included in **Appendix I**. A summary of the delineated wetland areas is presented below:

- **Wetlands 1 and 3** are small forested wetlands of 0.17-acre and 0.04-acre, respectively. The wetlands were inundated at the time of the site visit. These wetlands appear to be the result of accumulation of groundwater seepage under the dam. Neither wetland had a visible connection to other surface waters. Wetlands 1 and 3 have undergone recent, severe disturbance; all understory vegetation had been cleared, leaving only mature trees. There were tracks present from large equipment, presumably from the clearing of the understory. Classification using the ORAM scored these wetlands as Category 1 Wetlands (score of 28).
- **Wetland 2** is a relatively larger forested wetland of 1.71 acres. This wetland was inundated at the time of the site visit. This wetland is primarily fed by the seepage of groundwater from under the dam. Groundwater enters the wetland at several points with sufficient pressure to make the water appear to boil. Wetland 2 drains via a narrow stream of 108 linear feet (lf) into a larger body of water located to the west of the wetland. That body of water drains into Sandy Creek. Unlike Wetlands 1 and 3, Wetland 2 has not been subjected to clearing of the understory. A narrow path had been cleared adjacent to the wetland; however, this clearing had little to no effect on the wetland. A small portion of the wetland extends onto the field to the west of the wetland, where mowing may occur. The wetland contained significant amounts of the invasive reed canary grass (*Phalaris arundinacea*). The forest in and around the wetland were late second growth forest featuring a variety of deciduous species. Classification using ORAM scored this wetland as a Category 2 Wetland (score of 59.5).

5.0 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, jurisdictional areas identified during this study include, three forested wetlands of 0.04 acre, 0.17 acre, and 1.71 acres, and 108 lf of intermittent stream channel. One of the three wetlands, Wetland 2, has a surface connection to other "waters of the U.S." (i.e., Sandy Creek), while Wetlands 1 and 3 did not appear to have a surface connection to other surface waters. Categorization using ORAM scored Wetlands 1 and 3 as Category 1 Wetlands and Wetland 2 as a Category 2 Wetland.

6.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONALS

The Environmental Professionals who conducted the wetland delineations and completed this report for the USACE for the site located in Bolivar, Ohio (Tuscarawas County) are:

Mitchel R. Strain
Ecological Section Director

Signature: _____
Date: _____

Charles R. Wentzel
Environmental Scientist

Signature: _____
Date: _____

Burgess & Niple, Inc.
5085 Reed Road
Columbus, Ohio 43220
(614) 459-2050

7.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

Mr. Strain joined B&N in 1993 and is Director of the Ecological Services Section in our Environmental Division. Mr. Strain has 17 years of experience conducting and directing environmental projects ranging from Phase I Environmental Site Assessments for property transactions to Environmental Impact Statements (EIS) for major transportation and civil works projects. His particular expertise is in wetland science and natural channel design. He has completed all four levels of training offered by Dr. David L. Rosgen of Wildland Hydrology, and has directed stream mitigation and restoration projects for Clean Water Act (CWA) Section 404 and 401 permits, major highway projects, trout habitat restoration, acid mine drainage remediation, municipal development projects, water supply diversion, urban stream restoration, and CWA enforcement actions.

Mr. Wentzel joined B&N in 2005 as an Environmental Scientist. He participates in a wide range of environmental projects, including wetland delineations and Phase I Environmental Site Assessments (ESAs). Mr. Wentzel holds a Master of Science degree in Botany from the University of Wyoming and a Bachelor of Science degree in Ecology from The Ohio State University.

**APPENDIX A
PHOTOGRAPHS**



Ditch that crosses the site. Wetlands 1 & 3 are within the forest to the left of the ditch.
Wetland 2 is within the forest to the right of the ditch. (Nov 1, 2006)



Wetland 1. Note the lack of understory as the result of clearing. Bolivar Dam is the large hill seen in the background of this picture. (Nov 1, 2006)



Plot T1A (Nov 1, 2006)



Plot T1B (Nov 1, 2006)



Plot TIC (Nov 1, 2006)



Plot TID (Nov 1, 2006)



Plot T2A (Nov 1, 2006)



Plot T2B (Nov 1, 2006)



Plot T2C (Nov 1, 2006)



Plot T2D (Nov 1, 2006)



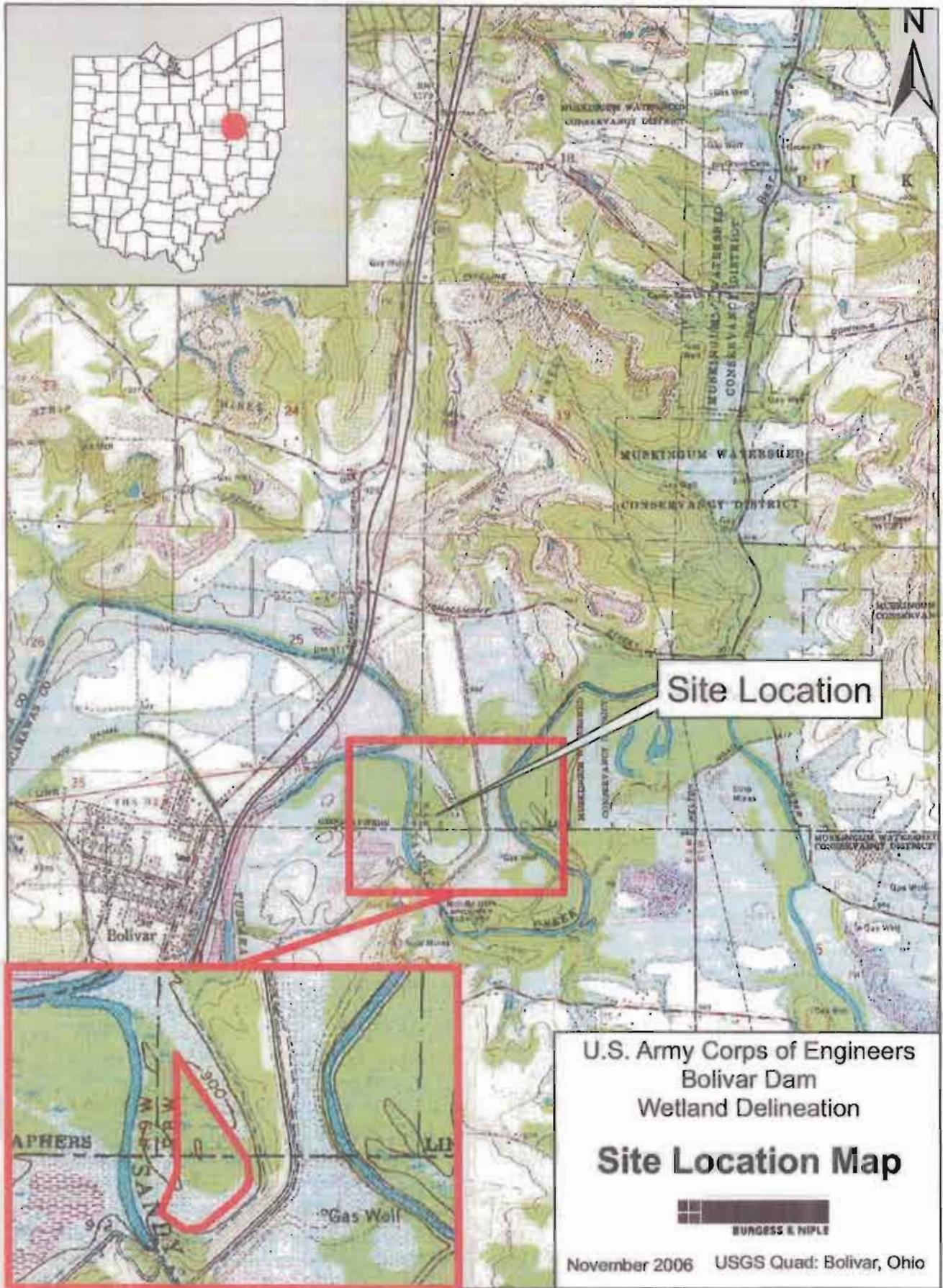
Plot T2E (Nov 1, 2006)



APPENDIX B
WETLAND DELINEATION MAP



APPENDIX C
USGS MAP



Site Location

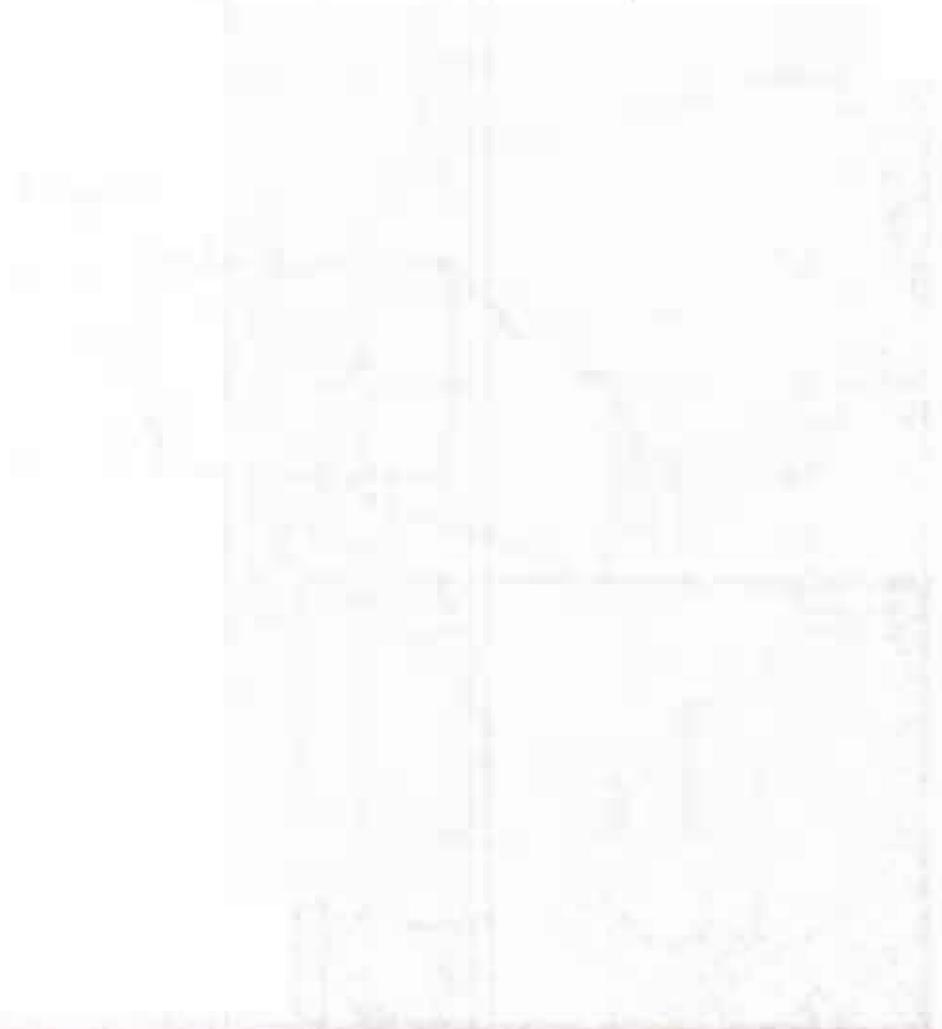
U.S. Army Corps of Engineers
Bolivar Dam
Wetland Delineation

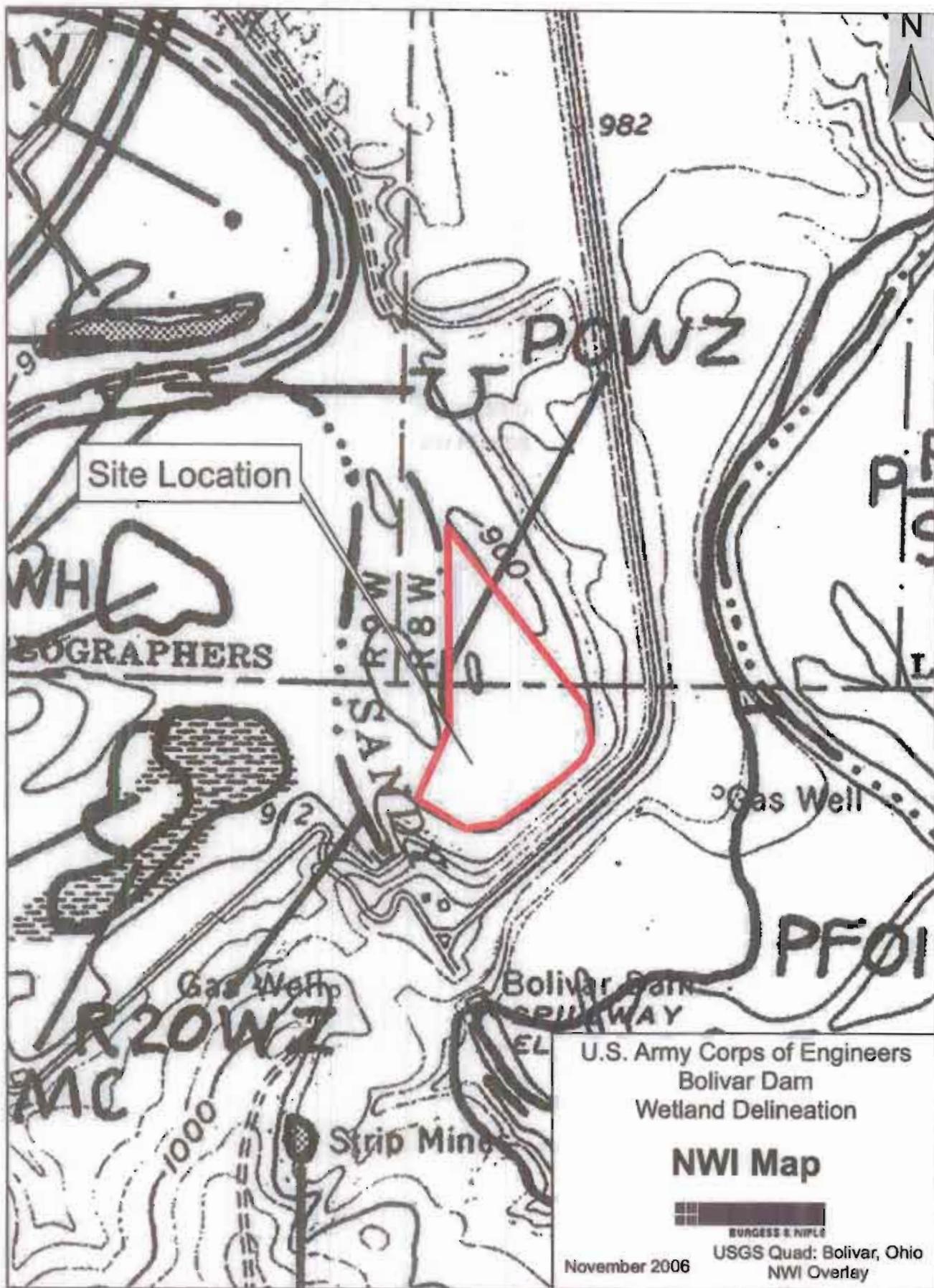
Site Location Map



November 2006 USGS Quad: Bolivar, Ohio

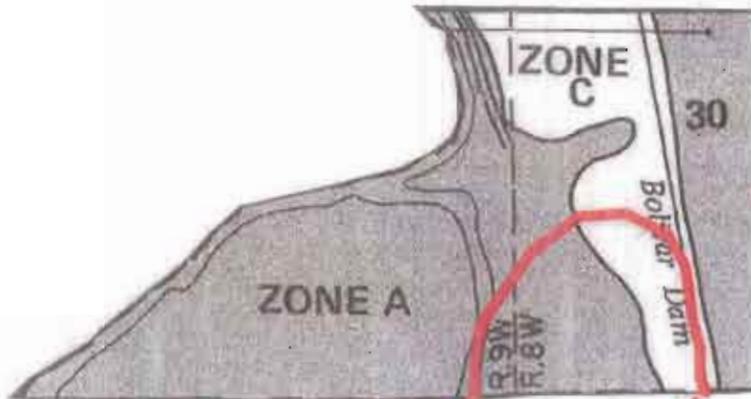
APPENDIX D
NWI MAP





**APPENDIX E
FIRM MAPS**

Northern Portion of Site



LEGEND

SPECIAL FLOOD HAZARD AREAS UNDELAYED BY 100-YEAR FLOOD

- ZONE A** In low flood elevation determined.
- ZONE AE** See flood elevation determined.
- ZONE AH** Flood depth of 1 to 2 feet (except areas of ponding); see flood elevation determined.
- ZONE AO** Flood depth of 1 to 2 feet (except areas of ponding); see flood elevation determined. For areas of flood for flooding, refer to the description.
- ZONE A99** To be protected from 100-year flood by Federal Flood insurance within same parameters as low elevation determined.
- ZONE V** Coastal flood with velocity based (see notes); see low flood elevation determined.
- ZONE VE** Coastal flood with velocity based (see notes); see flood elevation determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X** Areas of 100-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- ZONE X** Areas determined to be outside 100-year flood plain.
- ZONE D** Areas in which flood hazards are unassessable.

BOUNDARIES

- Flood Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Areas, and Secondary Channel Size Flood Categories Within Special Flood Hazard Zones.

OTHER FEATURES

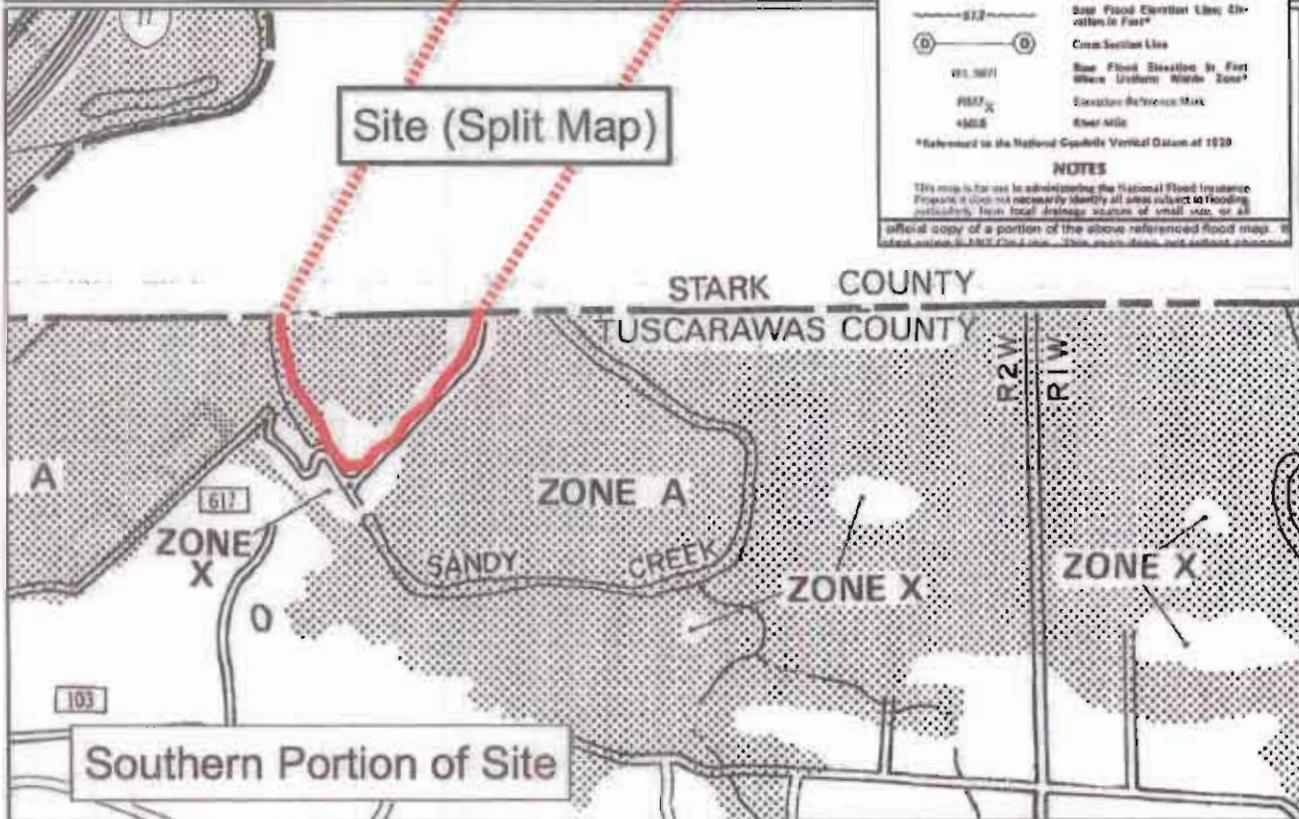
- Sea Flood Elevation Line (Elevation in Feet)
- Cross Section Line
- Sea Flood Elevation in Feet Where Uniform Within Zone*
- Elevation Reference Mark
- Water Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly, from local drainage systems of small size, or all official copies of the Flood Insurance Rate Map.

Site (Split Map)



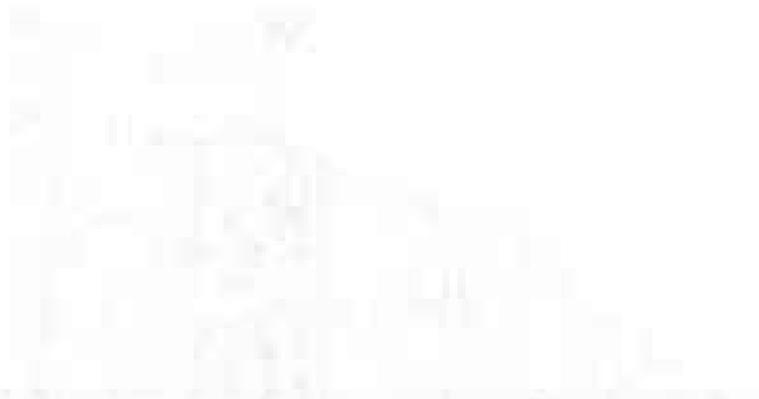
Southern Portion of Site



U.S. Army Corps of Engineers
 Bolivar Dam
 Wetland Delineation
**Flood Insurance
 Rate Map**

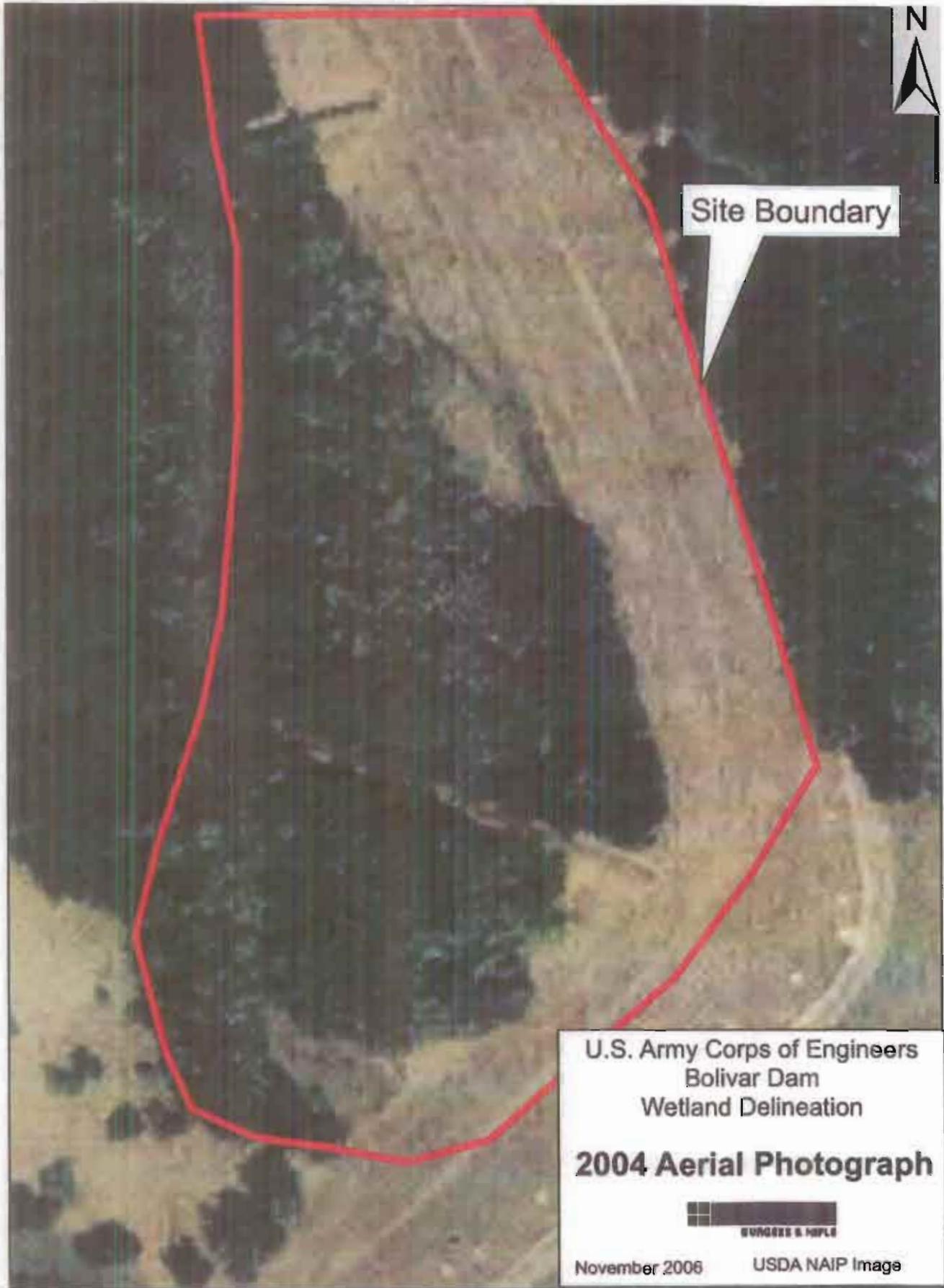
BURGESS & NIPLS

November 2006 Federal Emergency Management Agency



APPENDIX F
AERIAL PHOTOGRAPH





Site Boundary

U.S. Army Corps of Engineers
Bolivar Dam
Wetland Delineation

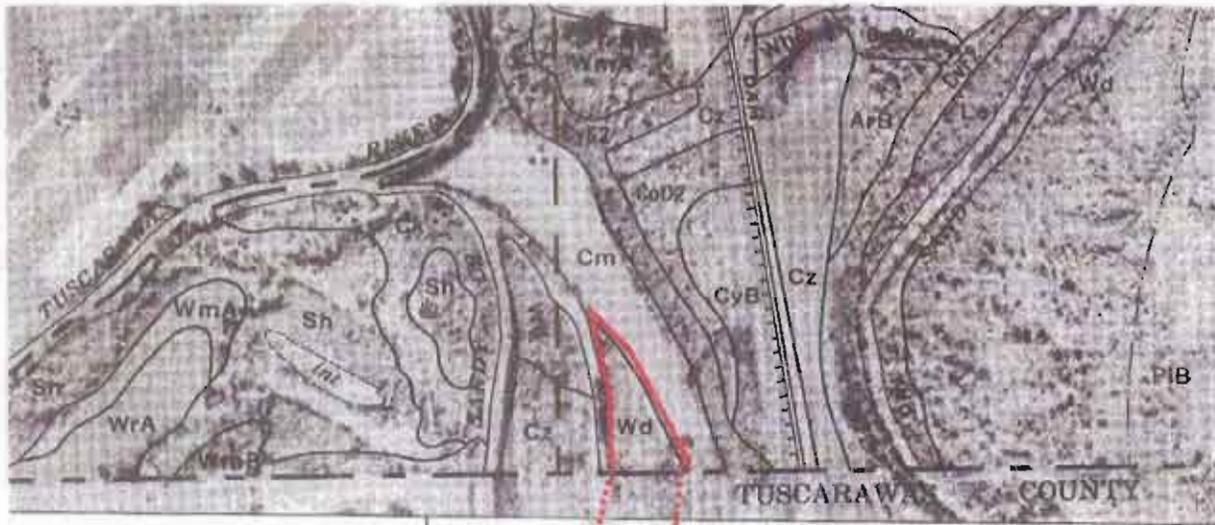
2004 Aerial Photograph



November 2006

USDA NAIP Image

APPENDIX G
SOILS MAP



TUSCARAWAS COUNTY, OHIO - SHEET NUMBER 4



U.S. Army Corps of Engineers
Bolivar Dam
Wetland Delineation

Soils Map



November 2006

USDA Soil Survey

**APPENDIX H
DATA SHEETS**

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2006
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Field
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T1
Is the area a potential Problem Area? (if needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T1A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Lysimachia nummularia</i> (creeping jenny)	Herb.	OBL	9.		
2. <i>Festuca rubra</i> (red fescue)	Herb.	FACU	10.		
3. <i>Juncus tenuis</i> (poverty rush)	Herb.	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 67%					
Remarks: Plot dominated by hydrophytic vegetation.					

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p>Stream, Lake, or Tide Gauge</p> <p>Aerial Photographs</p> <p>Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>18</u> (in.)</p>	
Remarks: No indicators of wetland hydrology were observed.	

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2006
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Forest
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T1
Is the area a potential Problem Area? (If needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T1B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Lysimachia nummularia</i> (creeping jenny)	Herb.	OBL	9.		
2. <i>Solidago canadensis</i> (Canada goldenrod)	Herb.	FACU	10.		
3. <i>Acer negundo</i> (boxelder)	Sap	FAC+	11.		
4. <i>Fraxinus pennsylvanica</i> (green ash)	Tree	FACW	12.		
5. <i>Acer saccharinum</i> (silver maple)	Tree	FACW	13.		
6.			14.		
7.			15.		
8.			16.		
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 80%					
Remarks: Plot dominated by hydrophytic vegetation.					

HYDROLOGY

<p>_____ Recorded Data (Describe in Remarks):</p> <p>_____ Stream, Lake, or Tide Gauge</p> <p>_____ Aerial Photographs</p> <p>_____ Other</p> <p><u> X </u> No Recorded Data Available</p> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>_____ Inundated</p> <p>_____ Saturated in Upper 12 Inches</p> <p>_____ Water Marks</p> <p>_____ Drift Lines</p> <p>_____ Sediment Deposits</p> <p>_____ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>_____ Oxidized Root Channels in Upper 12 Inches</p> <p>_____ Water-Stained Leaves</p> <p>_____ Local Soil Survey Data</p> <p>_____ FAC-Neutral Test</p> <p>_____ Other (Explain in Remarks)</p>
Remarks: No indicators of wetland hydrology were observed.	

SOILS

Map Unit Name (Series and Phase): Melvin silt loam, frequently flooded		Drainage Class: Poorly Drained			
Taxonomy (Subgroup): Fine-silty, mixed, nonacid, mesic typic Fluvaquents		Field Observations Confirm Mapped Type? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		10YR 2/2	n/a	n/a	Silty Clay Loam
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Refusal at 6 inches. Soils are not hydric.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Check) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	(Check) Is This Sampling Point Within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Hydric Soils Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: This plot is not located in a wetland		

Approved by HQUSACE 3/92

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2006
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Forest
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T1
Is the area a potential Problem Area? (If needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T1C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Lysimachia nummularia</i> (creeping jenny)	Herb.	OBL	9.		
2. <i>Carex</i> spp. (sedge spp.)	Herb.	FAC*	10.		
3. <i>Acer negundo</i> (boxelder)	Sap	FAC+	11.		
4. <i>Fraxinus pennsylvanica</i> (green ash)	Tree	FACW	12.		
5. <i>Ulmus americana</i> (American elm)	Tree	FACW-	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: * = *Carex* species assumed to be at least FAC. Plot dominated by hydrophytic vegetation.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p>Stream, Lake, or Tide Gauge _____</p> <p>Aerial Photographs _____</p> <p>Other _____</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>Water Marks _____</p> <p>Drift Lines _____</p> <p>Sediment Deposits _____</p> <p>Drainage Patterns in Wetlands _____</p> <p>Secondary Indicators (2 or more required):</p> <p>Oxidized Root Channels in Upper 12 Inches _____</p> <p>Water-Stained Leaves _____</p> <p>Local Soil Survey Data _____</p> <p>FAC-Neutral Test _____</p> <p>Other (Explain in Remarks) _____</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>2</u> (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>Surface</u> (in.)</p>	
<p>Remarks: Indicators of wetland hydrology were observed.</p>	

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2006
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Forest
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T1
Is the area a potential Problem Area? (If needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T1D

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Lysimachia nummularia</i> (creeping jenny)	Herb.	OBL	9.		
2. <i>Carex intumescens</i> (greater bladder sedge)	Herb.	FACW+	10.		
3. <i>Aster vimineus</i> (small white aster)	Herb.	FACW	11.		
4. <i>Geum canadense</i> (white avens)	Herb.	FACU	12.		
5. <i>Fraxinus pennsylvanica</i> (green ash)	Sap	FACW	13.		
6. <i>Ulmus americana</i> (American elm)	Tree	FACW-	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 83%

Remarks: Plot dominated by hydrophytic vegetation.

HYDROLOGY

Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Remarks: No indicators of wetland hydrology were observed.	

SOILS

Map Unit Name (Series and Phase): Melvin silt loam, frequently flooded		Drainage Class: Poorly Drained			
Taxonomy (Subgroup): Fine-silty, mixed, nonacid, mesic typic Fluvaquents		Field Observations Confirm Mapped Type? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Profile Description:					
Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-24		7.5 YR 4/2	n/a	n/a	Sandy Loam
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions			
_____ Histic Epipedon		_____ High Organic Content in Surface Layer in Sandy Soils			
_____ Sulfidic Odor		_____ Organic Streaking in Sandy Soils			
_____ Aquic Moisture Regime		_____ Listed on Local Hydric Soils List			
_____ Reducing Conditions		_____ Listed on National Hydric Soils List			
_____ Gleyed or Low-Chroma Colors		_____ Other (Explain in Remarks)			
Remarks: Soils are not hydric.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Check) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is This Sampling Point Within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Hydric Soils Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: This plot is not located in a wetland		

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2006
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Keams	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Field
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T2
Is the area a potential Problem Area? (If needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T2A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Festuca rubra (red fescue)	Herb.	FACU	9.		
2. Rosa multiflora (multiflora rose)	Herb.	FACU	10.		
3. Rumex crispus (curled dock)	Herb.	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%					
Remarks: Plot is not dominated by hydrophytic vegetation.					

HYDROLOGY

_____ Recorded Data (Describe in Remarks): _____ Stream, Lake, or Tide Gauge _____ Aerial Photographs _____ Other _____ <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: _____ Inundated _____ Saturated in Upper 12 Inches _____ Water Marks _____ Drift Lines _____ Sediment Deposits _____ Drainage Patterns in Wetlands
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Secondary Indicators (2 or more required): _____ Oxidized Root Channels in Upper 12 Inches _____ Water-Stained Leaves _____ Local Soil Survey Data _____ FAC-Neutral Test _____ Other (Explain in Remarks)
Remarks: No indicators of wetland hydrology were observed.	

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2008
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Forest
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T2
Is the area a potential Problem Area? (If needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T2B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea (reed canary)	Herb.	FACW+	9.		
2. Acer negundo (boxelder)	Sap.	FAC+	10.		
3. Ulmus americana (American elm)	Sap.	FACW-	11.		
4. Fraxinus pennsylvanica (green ash)	Tree	FACW	12.		
5. Salix nigra (black willow)	Tree	FACW+	13.		
6.			14.		
7.			15.		
8.			16.		
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%					
Remarks: Plot dominated by hydrophytic vegetation.					

HYDROLOGY

<p>_____ Recorded Data (Describe in Remarks):</p> <p>_____ Stream, Lake, or Tide Gauge</p> <p>_____ Aerial Photographs</p> <p>_____ Other</p> <p>_____ No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>_____ <input checked="" type="checkbox"/> Inundated</p> <p>_____ <input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>_____ <input checked="" type="checkbox"/> Water Marks</p> <p>_____ Drift Lines</p> <p>_____ Sediment Deposits</p> <p>_____ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>_____ Oxidized Root Channels in Upper 12 Inches</p> <p>_____ Water-Stained Leaves</p> <p>_____ Local Soil Survey Data</p> <p>_____ FAC-Neutral Test</p> <p>_____ Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>12</u> (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	
Remarks: Indicators of wetland hydrology were observed.	

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2006
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Field
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T2
Is the area a potential Problem Area? (If needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T2C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Alliaria petiolata</i> (garlic mustard)	Herb.	FACU-	9.		
2. <i>Geum canadense</i> (white avens)	Herb.	FACU	10.		
3. <i>Aster vimineus</i> (small white aster)	Herb.	FACW	11.		
4. <i>Rosa multiflora</i> (multiflora rose)	Vine	FACU	12.		
5. <i>Acer negundo</i> (boxelder)	Sap.	FAC+	13.		
6. <i>Acer saccharinum</i> (silver maple)	Tree	FACW	14.		
7. <i>Ulmus americana</i> (American elm)	Tree	FACW-	15.		
8. <i>Fraxinus pennsylvanica</i> (Green Ash)	Tree	FACW	16.		
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 63%					
Remarks: Plot is dominated by hydrophytic vegetation.					

HYDROLOGY

<p>_____ Recorded Data (Describe in Remarks):</p> <p>_____ Stream, Lake, or Tide Gauge</p> <p>_____ Aerial Photographs</p> <p>_____ Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>_____ Inundated</p> <p>_____ Saturated in Upper 12 Inches</p> <p>_____ Water Marks</p> <p>_____ Drift Lines</p> <p>_____ Sediment Deposits</p> <p>_____ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>_____ Oxidized Root Channels in Upper 12 Inches</p> <p>_____ Water-Stained Leaves</p> <p>_____ Local Soil Survey Data</p> <p>_____ FAC-Neutral Test</p> <p>_____ Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	
Remarks: No indicators of wetland hydrology were observed.	

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Bolivar Dam, Bolivar, Ohio	Date: November 10, 2008
Applicant/Owner: U.S. Army Corps of Engineers	County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns	State: Ohio
Do Normal Circumstances Exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Forest
Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T2
Is the area a potential Problem Area? (If needed, explain on reverse.) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T2D

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Lysimachia nummularia</i> (creeping jenny)	Herb.	OBL	9.		
2. <i>Carex</i> spp. (sedge spp.)	Herb.	FAC*	10.		
3. <i>Acer negundo</i> (boxelder)	Sap	FAC+	11.		
4. <i>Fraxinus pennsylvanica</i> (green ash)	Tree	FACW	12.		
5. <i>Ulmus americana</i> (American elm)	Trees	FACW-	13.		
6.			14.		
7.			15.		
8.			16.		
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%					
Remarks: * = <i>Carex</i> species assumed to be at least FAC. Plot dominated by hydrophytic vegetation.					

HYDROLOGY

<p>_____ Recorded Data (Describe in Remarks):</p> <p>_____ Stream, Lake, or Tide Gauge</p> <p>_____ Aerial Photographs</p> <p>_____ Other</p> <p>_____ No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>_____ <input checked="" type="checkbox"/> Inundated</p> <p>_____ <input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>_____ <input checked="" type="checkbox"/> Water Marks</p> <p>_____ Drift Lines</p> <p>_____ Sediment Deposits</p> <p>_____ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>_____ Oxidized Root Channels in Upper 12 Inches</p> <p>_____ Water-Stained Leaves</p> <p>_____ Local Soil Survey Data</p> <p>_____ FAC-Neutral Test</p> <p>_____ Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>4</u> (in.)</p> <p>Depth to Free Water in Pit: <u>Surface</u> (in.)</p> <p>Depth to Saturated Soil: <u>Surface</u> (in.)</p>	
Remarks: Indicators of wetland hydrology were observed.	

SOILS

Map Unit Name (Series and Phase): <u>Meivin silt loam, frequently flooded</u>		Drainage Class: <u>Poorly Drained</u>			
Taxonomy (Subgroup): <u>Fine-silty, mixed, nonacid, mesic typic Fluvaquents</u>		Field Observations Confirm Mapped Type? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Profile Description:					
Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		10YR 5/2	10YR 5/8	Common/Distinct	Silty Clay
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: <u>Refusal at 12 inches. Soils are hydric.</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Check) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is This Sampling Point Within a Wetland?	(Check) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: <u>This plot is located in a wetland</u>			

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bolivar Dam, Bolivar, Ohio		Date: November 10, 2008
Applicant/Owner: U.S. Army Corps of Engineers		County: Tuscarawas & Stark
Investigator: Charles R. Wentzel & Michelle Kearns		State: Ohio
Do Normal Circumstances Exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: Field
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: T2
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: T2E

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Rosa multiflora</i> (multiflora rose)	Vine	FACU	9.		
2. <i>Acer negundo</i> (boxelder)	Sap.	FAC+	10.		
3. <i>Fraxinus pennsylvanica</i> (green ash)	Tree	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 67%

Remarks: Area has been altered by clearing of understory. Plot is not dominated by hydrophytic vegetation.

HYDROLOGY

_____ Recorded Data (Describe in Remarks): _____ Stream, Lake, or Tide Gauge _____ Aerial Photographs _____ Other _____ X No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: _____ Inundated _____ Saturated in Upper 12 inches _____ Water Marks _____ Drift Lines _____ Sediment Deposits _____ Drainage Patterns in Wetlands
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Secondary Indicators (2 or more required): _____ Oxidized Root Channels in Upper 12 inches _____ Water-Stained Leaves _____ Local Soil Survey Data _____ FAC-Neutral Test _____ Other (Explain in Remarks)
Remarks: No indicators of wetland hydrology were observed.	

SOILS

Map Unit Name (Series and Phase): Melvin silt loam, frequently flooded		Drainage Class: Poorly Drained			
Taxonomy (Subgroup): Fine-silty, mixed, nonacid, mesic typic Fluvaquents		Field Observations Confirm Mapped Type? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-24		7.5 YR 3/2	n/a	n/a	Sandy Clay
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions			
_____ Histic Epipedon		_____ High Organic Content in Surface Layer in Sandy Soils			
_____ Sulfidic Odor		_____ Organic Streaking in Sandy Soils			
_____ Aquic Moisture Regime		_____ Listed on Local Hydric Soils List			
_____ Reducing Conditions		_____ Listed on National Hydric Soils List			
_____ Gleyed or Low-Chroma Colors		_____ Other (Explain in Remarks)			
Remarks: Soils are not hydric.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Check) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is This Sampling Point Within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Hydric Soils Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: This plot is not located in a wetland		

Approved by HQUSACE 3/92

Item	Score	Comments
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**APPENDIX I
ORAM SCORE SHEETS**

Item	Score	Comments
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Version 5.0	Ohio Rapid Assessment Method for Wetlands	
	Background Information Score Boundary Worksheet Narrative Rating Quantitative Rating Categorization Worksheets Field Scoring Form	Ohio EPA, Division of Surface Water Final: February 1, 2001
Pursuant to ORC Section 3745.30, the Ohio Rapid Assessment Method for Wetlands is a guidance or policy and DOES NOT HAVE THE FORCE OF LAW		

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

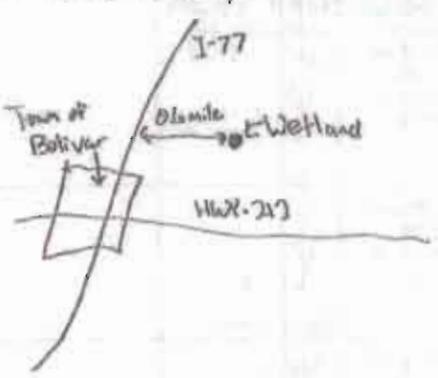
The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at the following address: <http://www.epa.state.oh.us/dsw/401/401.html>

Wetland 1st 3

Background Information

Name: Charles Wentzel	
Date: November 1, 2006	
Affiliation: Burgess & Niple, Inc	
Address: 5085 Reed Rd, Columbus, OH 43220	
Phone Number: (740) 459-2050	
e-mail address: cwentzel@burnip.com	
Name of Wetland: Wetland	
Vegetation Community(ies): Forested	
HGM Class(es): Depression	
<p>Location of Wetland include map, address, north arrow, landmarks, distances, roads, etc.</p> <p>Bolivar Dam, Bolivar, Tuscarawas County, Ohio</p> 	
(Lat/Long) or UTM Coordinate	40.6531 -81.4318
USGS Quad Name	Bolivar
County	Tuscarawas
Township	-
Section and Subsection	-
Hydrologic Unit Code	Tuscarawas 05040001
Site Visit	Yes
National Wetland Inventory Map	Yes
Ohio Wetland Inventory Map	No
Soil Survey	Yes
Delineation report/map	Yes
Wetland Size (acres, hectares)	0.21-acre

Scoring Boundary Worksheet

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

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a mitigation site, conservation site, etc.	Yes	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	Ditch between wetlands 13 and wetland 2 Yes	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	Yes No changes	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	Yes None present	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	No	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	Yes	

Narrative Rating

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

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (85 FR 41812 July 8, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	<input checked="" type="radio"/> NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	<input checked="" type="radio"/> NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	<input checked="" type="radio"/> NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	<input checked="" type="radio"/> NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	<input checked="" type="radio"/> NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	<input checked="" type="radio"/> NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	<input checked="" type="radio"/> NO Go to Question 8a

#	Question	Circle one	
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b
8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 9d	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 9d
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the graminaceous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio, Erie County, and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

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

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

Quantitative Rating

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland. Select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.		score
6pts	≥50 acres (> 20.2ha)	
5pts	25 - <50 acres (10.1 - <20.2ha)	
4pts	10 - <25 acres (4.0 - <10.1ha)	
3pts	3 - <10 acres (1.2 - <4.0ha)	
2pts	0.3 - <3 acres (0.12 - <1.2ha)	
1pt	0.1 - <0.3 acres (0.04 - <0.12ha)	1
0pts	< 0.1 acres (0.04ha)	

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft ²	yd ²	ft on side	yd on side	ha	m ²	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 2. Upland buffers and intensity of surrounding land uses. Maximum 14 points. Wetlands are systems transitional between upland and aquatic environments. Wetlands without "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded.		score
2a. Average Buffer Width (abw). Calculate the average buffer width and select only one score. To calculate abw, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: abw of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: $abw = (50m + 25m + 10m + 0m)/4 = 21.25m$. Intensive land uses are not buffers, e.g. active row cropping, recently abandoned fields, paved areas, housing developments, unfenced pasture, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s). Select one, or double check up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone (if any).		
7pts	VERY LOW. 2 nd growth or older forest, prairie, savannah, wildlife area, etc.	
5pts	LOW. Old field (>10 yrs), shrubland, young 2 nd growth forest, etc.	X
3pts	MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field, etc.	X
1pt	HIGH. urban, industrial, open pasture, row cropping, mining, construction, etc.	

12
 subtotal

12

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<p>Metric 3. Hydrology. Maximum 30 points. This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity. A wetland can receive no more than 30 points for Metric 3 even though it is possible, to score more than 30 points.</p>		
<p>3a. Sources of Water. Select all that apply and sum score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.</p>		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pt	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
<p>3b. Connectivity. Select all that apply and sum score.</p>		
1pt	100 year floodplain. "Floodplain" is defined in OAC Rule 3745-1-50(P) as "... the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	1
1pt	between stream/lake and other human land use. This question asks whether the wetland is located <u>between</u> a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	part of wetland or upland (e.g. forest, prairie) complex. Both this and the next question ask whether the wetland is in physical proximity to, or a part of other nearby wetland or upland natural areas. The difference is whether the area the wetland is "long and narrow" like a river, or more "squadsh" like a large forest or woodlot. If the latter is the case, this question applies; if the former, the next question applies. In a few instances, both may apply	
1pt	part of riparian or upland corridor. See description above.	
<p>3c. Maximum water depth. Select only one and assign score. The Rater <i>does not</i> need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.</p>		
3pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
<p>3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of secondary indicators is necessary and expected in order to properly answer this Question. Categories correspond to Zones II, III, and IV of 1987 Manual (Table 5). Zone IV subdivided into seasonally inundated and seasonally saturated.</p>		
4pts	Semipermanently to permanently inundated or saturated.	
3pts	Regularly inundated or saturated.	
2pts	Seasonally inundated.	2
1pt	Seasonally saturated in the upper 30cm (12in) of soil.	

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3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the Rater to evaluate the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

It is very important to stress that this question does not discriminate between wetlands with different types of hydrologic regimes, e.g. between a forested seep wetland located on a floodplain with seasonal inundation and a leatherleaf (*Chamaedaphne calyculata*) bog with precipitation and minor amounts of surface run-off from a small watershed. Rather, it asks the rater to evaluate the "intactness" of the hydrologic regime attributable to that type of wetland. In the example above, both the forested seep wetland and the leatherleaf bog can score the maximum points (12) if there no, or no apparent, modifications to the natural hydrologic regime.

Once the Rater has listed all possible past and ongoing disturbances, the Rater should check the most appropriate category to describe the present state of the wetland. In instances where the Rater believes that a wetland falls between two categories, or where the Rater is uncertain as to which category is appropriate, it is appropriate to "double check" and average the score.

The labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a hydrologic disturbance continuum, from very high to very low or no disturbance.

The Rater may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

<input checked="" type="checkbox"/>	ditch(es), in or near the wetland	<input type="checkbox"/>	point source discharges to the (non-stormwater)
<input type="checkbox"/>	tile(s), in or near the wetland	<input type="checkbox"/>	filling/grading activities in or near the wetland
<input type="checkbox"/>	dike(s), in or near the wetland	<input type="checkbox"/>	road beds/RR beds in or near the wetland
<input type="checkbox"/>	weir(s), in or near the wetland	<input type="checkbox"/>	dredging activities in or near the wetland
<input type="checkbox"/>	stormwater inputs (addition of water)	<input checked="" type="checkbox"/>	other (specify) <i>Botivar Dam</i>

Circle one answer. Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime, or have they occurred so far in the past that current hydrology should be considered to be "natural"?	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Double check "none or none apparent" and "recovered" and assign a score of 9.5.
	Select one or double check adjoining numbers and average the score.		

12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the rater.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	<input checked="" type="checkbox"/>
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	<input checked="" type="checkbox"/>
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

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<p>Metric 4. Habitat Alteration and Development. Maximum 20 points. While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. This metric attempts to evaluate these things under the rubric "habitat alteration." In many instances, items checked as possible hydrologic disturbances in Question 3a will be instead alterations to a wetland's habitat or disruptions in its development (successional state). In other instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. In any case, the Rater should carefully consider what is the actual proximate (direct) cause of the disturbance to the wetland.</p>			
<p>4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.</p> <p>Examples of substrate/soil disturbance include filling and grading, plowing, grazing (hooves), vehicle use (motorbikes, off-road vehicles, construction vehicles), sedimentation, dredging, and other mechanical disturbances to the surface substrates or soils.</p>			
<p>Circle one answer. Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils or substrates, or have they occurred so far in the past that current conditions should be considered to be "natural"?</p>	<p>YES</p> <p>Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.</p>	<p>NO</p> <p>Assign a score of 4 since there are no or no apparent modifications.</p>	<p>NOT SURE</p> <p>Double check "none or none apparent" and "recovered" and assign a score of 3.5.</p>
<p>Select one or double check adjoining numbers and average the score.</p>			<p>score</p>
4pts	<p>NONE OR NONE APPARENT. There are no disturbances, or no disturbances apparent to the Rater.</p>		
3pts	<p>RECOVERED. The wetland appears to have recovered from past disturbances.</p>		
2pts	<p>RECOVERING. The wetland appears to be in the process of recovering from past disturbances.</p>		
1pt	<p>RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.</p>		1
<p>4b. Habitat development. Select only one and assign score. This question asks the Rater to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically or hydrogeomorphically similar wetlands. This question presumes a good sense of the types of wetlands and the range in quality typical of the region, watershed, or state.</p>			
7pts	<p>EXCELLENT. Wetland appears to represent the best of its type or class.</p>		
6pts	<p>VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.</p>		
5pts	<p>GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.</p>		
4pts	<p>MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.</p>		
3pts	<p>FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances; successional state, etc. is not good.</p>		
2pts	<p>POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.</p>		
1pt	<p>POOR. Wetland appears to <u>not</u> be a good example of its type or class because of past or present disturbances; successional state, etc.</p>		

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4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify a possible alterations. Evaluate whether the alteration is trivial in relation to the wetland's overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. In some instances, the scores can be viewed as a habitat alteration continuum, from very high to very low or no disturbance. The Rater may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.

Check all that are observed present in or near the wetland.

<input type="checkbox"/>	Mowing	<input type="checkbox"/>	Herbaceous layer/aquatic bed removal
<input type="checkbox"/>	Grazing (cattle, sheep, plgs, etc.)	<input type="checkbox"/>	Sedimentation
<input type="checkbox"/>	Clearcutting	<input type="checkbox"/>	Dredging
<input checked="" type="checkbox"/>	Selective cutting	<input type="checkbox"/>	Farming
<input checked="" type="checkbox"/>	Woody debris removal	<input type="checkbox"/>	Nutrient enrichment, e.g. nuisance algae
<input type="checkbox"/>	Toxic pollutants	<input type="checkbox"/>	Other (specify)
<input checked="" type="checkbox"/>	Shrub/sapling removal	<input type="checkbox"/>	Other (specify)

<p>Circle one answer. Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat, or have occurred so far in the past that current habitat should be considered to be "natural"?</p>	<p>YES</p> <p>Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.</p>	<p>NO</p> <p>Assign a score of 0 since there are no or no apparent modifications.</p>	<p>NOT SURE</p> <p>Double check "none or none apparent" and "recovered" and assign a score of 7.5.</p>
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Select one score or double check adjoining numbers and average the score.		
9pts	NONE OR NONE APPARENT. There are no alterations, or no alterations that are apparent to the Rater.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	1

Metric 5. Special wetland communities. Maximum 10 points. Assign or deduct points if wetland has the feature described. Refer to Narrative Rating for guidance. No wetland can receive more than 10 points even if multiple categories are applicable.		score	
<input type="checkbox"/>	Bog (10 pts)	<input type="checkbox"/>	Lake plains sand prairies (Oak Openings) (10 pts)
<input type="checkbox"/>	Fen (10 pts)	<input type="checkbox"/>	Relict wet prairies (10 pts)
<input type="checkbox"/>	Old Growth Forest (10 pts)	<input type="checkbox"/>	Known occurrence of threatened/endangered species (10 pts)
<input type="checkbox"/>	Mature Forested Wetland (5 pts)	<input type="checkbox"/>	Significant migratory songbird/waterfowl habitat (10 pts)
<input type="checkbox"/>	Coastal wetlands, unrestricted hydrology (10 pts)	<input type="checkbox"/>	Category 1 wetlands (See Narrative Rating #5) (-10 pts)
<input type="checkbox"/>	Coastal wetlands, restricted hydrology (5 pts)	<input type="checkbox"/>	

subtotal

Metric 6. Vegetation, Interspersion, and Microtopography. Maximum 20 points.		
<p>6a. Wetland Vegetation Communities. Check each community present both <u>vertically</u> and <u>horizontally</u> within the wetland with an area of at least 0.1hectares or 1000m² (0.2471 acres). Assign a score of 0 to 3 using Tables 3, Table 4 or Table 5. Sum the scores for the classes present.</p>		
	<p>Aquatic Bed. Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (<i>Lemna</i> spp., <i>Spirodela</i> spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.</p>	
	<p>Emergent. Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, fens, prairie pothole, and bluejoint slough.</p>	
	<p>Shrub. Includes areas of wetlands dominated by woody vegetation less than 6m (20 ft) tall. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.</p>	
X	<p>Forested. Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are defined as "vernal pools" in OAC Rule 3745-1-50.</p>	2
	<p>Mudflats. The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB₃) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates, with vegetative cover less than 30%.</p>	
	<p>Open water. The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas re 1) inundated, 2) unvegetated, and 3) "open", i.e. there is no "canopy" of any type of vegetation.</p>	
	<p>Other (See User's Manual)</p>	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 6 for narrative descriptions of what "low," "moderate," and "high" quality mean.

Cover score	Description
0	the vegetation community is either: 1) absent from wetland, or 2) comprises less than 0.1ha (0.2471 acres) of contiguous area within the wetland
1	vegetation community is present and either: 1) comprises a small part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation, the community is of low quality
2	the vegetation community is present and either: 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	the vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation.

Table 4. Use this table in conjunction with Table 5 to determine what is a "low," "moderate," or "high" quality community.

narrative	description
low	low species diversity and/or a predominance of non-native or disturbance tolerant native species
moderate	native species are the dominant component of the vegetation, although non-native or disturbance tolerant native species can also be present, and species diversity is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species
high	a predominance of native species, with non-native species absent or virtually absent, and high species diversity and sometimes, but not always, the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover score.

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

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6b. Horizontal (plan view) Interspersion. Select only one and assign score. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.		
5pts	HIGH. Wetland has a high degree of interspersion.	
4pts	MODERATELY HIGH. Wetland has a moderately high degree of interspersion.	
3pts	MODERATE. Wetland has a moderate degree of interspersion.	
2pts	MODERATELY LOW. Wetland has a moderately low degree of interspersion.	
1pt	LOW. Wetland has a low degree of interspersion.	
0pts	NONE. Wetland has no plan view interspersion.	0

6c. Coverage of Invasive Plant Species. Refer to Table 1 on Page 7 for list. Select only one and assign score.		
-5pts	Extensive. >75% areal cover of invasive species	
-3pts	Moderate 25-75% areal cover of invasive species	
-1pt	Sparse. 5-25% areal cover of invasive species	
0pts	Nearly absent. <5% areal cover of invasive species	
1pt	Absent.	1

6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopographic habitat features often present in wetlands.		
Vegetated hummocks and tussocks.		
Coarse woody debris >15cm (6in) in diameter		
Standing dead trees >25cm (10in) diameter at breast height		
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction.		

Table 6. Cover scale for microtopographic habitat features.

microtopographic habitat quality	narrative description
0	feature is absent or functionally absent from the wetland
1	feature is present in the wetland in very small amounts or if more common, of low quality
2	feature is 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

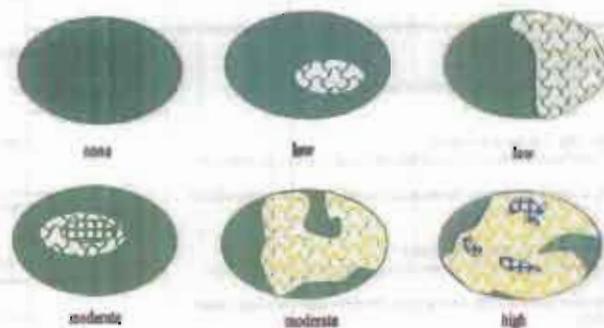


Figure 1. Hypothetical wetlands for estimating degree of interspersion.

GRAND TOTAL

End of Quantitative Rating. Complete Categorization Worksheets.

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 Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 1.
	Question 6. Bogs	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 7. Fens	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted.	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	11	
	Metric 3. Hydrology	10	
	Metric 4. Habitat	3	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersal, microtopography	3	
	TOTAL SCORE Consult most recent score calibration report at http://www.epa.state.oh.us/djw/401/401.html to determine the wetland's category based on its quantitative score	28	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet

Wetland Categorization Worksheet

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

Final Category

Choose one	<input checked="" type="radio"/> Category 1	<input type="radio"/> Category 2	<input type="radio"/> Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Ohio Rapid Assessment Method for Wetlands		
Version 5.0	Background Information	Ohio EPA, Division of Surface Water Final: February 1, 2001
	Score Boundary Worksheet	
Narrative Rating		
Quantitative Rating		
Categorization Worksheets		
	Field Scoring Form	
Pursuant to ORC Section 3745.30, the Ohio Rapid Assessment Method for Wetlands is a guidance or policy and DOES NOT HAVE THE FORCE OF LAW		

Instructions

The investigator is **STRONGLY URGED** to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is **VERY IMPORTANT** to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at the following address: <http://www.epa.state.oh.us/dsw/401/401.html>

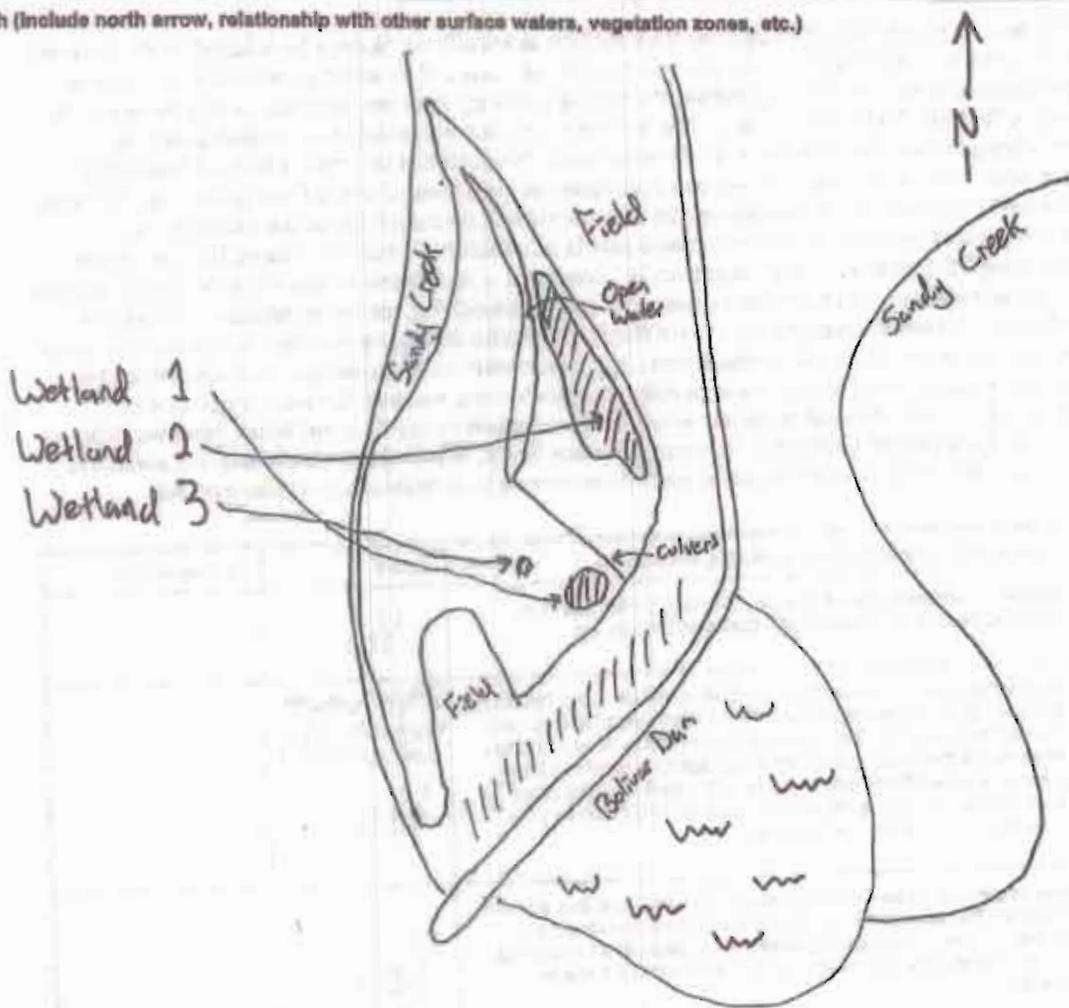
Wetland 2

Background Information

Name: Charles Wentzel	
Date: November 1, 2006	
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Address: 5085 Reed Rd, Columbus, OH 43220	
Phone Number: (740) 459-2050	
e-mail address: cwentzel@burnip.com	
Name of Wetland: Wetland 2	
Vegetation Community(ies): Forested	
HGM Class(es): Depression	
Location of Wetland include map, address, north arrow, landmarks, distances, roads, etc. Bolivar Dan, Bolivar, Tuscarawas County, Ohio	
Lat/Long or UTM Coordinate	40.6531 -81.4318
USGS Quad Name	Bolivar
County	Tuscarawas
Township	-
Section and Subsection	-
Hydrologic Unit Code	Tuscarawas 05040001
Site Visit	Yes
National Wetland Inventory Map	Yes
Ohio Wetland Inventory Map	No
Soil Survey	Yes
Delineation report/map	Yes
Wetland Size (acres, hectares)	1.71-acre

Name: Wetland 2

sketch (include north arrow, relationship with other surface waters, vegetation zones, etc.)



Comments, Narrative Discussion, Justification of Category Changes

- Wetlands 1, 2, & 3 occur at the base of Bolivar Dam
- Wetland 1 & 3 are closely associated depressional wetlands. Understory vegetation in and around the area of wetland 1 & 3 has been cleared in the very recent past. The equipment used in the clearing also created surficial soil disturbances
- Wetland 2 is a larger wetland in a relatively undisturbed area. It is fed in part by seepage from under the dam
- Wetland 1 & 3 do not appear to be fed by seepage from under the dam

Final score : 59.5

Category 2

Scoring Boundary Worksheet

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

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a mitigation site, conservation site, etc.	Yes	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	Ditch between wetlands #3 and wetland 2 Yes	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	Yes No changes	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	Yes None present	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	No	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	Yes	

Table 1. Characteristic plant species.

Invasive/exotic spp	fen species	bog species	Shrub Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zizadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex olerodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex hexaumbi</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pallida</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne corymbulata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Hellianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis spp.</i>	<i>Lurix laricina</i>		<i>Liatis spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemophanthus mucronatus</i>		<i>Lysimochia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum spp.</i>		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serotima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Taraxacum officinale</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

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

Quantitative Rating

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland. Select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.		score
6pts	≥50 acres (≥ 20.2ha)	
5pts	25 - <50 acres (10.1 - <20.2ha)	
4pts	10 - <25 acres (4.0 - <10.1ha)	
3pts	3 - <10 acres (1.2 - <4.0ha)	
2pts	0.3 - <3 acres (0.12 - <1.2ha)	2
1pt	0.1 - <0.3 acres (0.04 - <0.12ha)	
0pts	< 0.1 acres (0.04ha)	

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft ²	yd ²	ft on side	yd on side	ha	m ²	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 2. Upland buffers and intensity of surrounding land uses. Maximum 14 points. Wetlands are systems transitional between upland and aquatic environments. Wetlands without "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded.		score
2a. Average Buffer Width (abw). Calculate the average buffer width and select only one score. To calculate abw, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: abw of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: $abw = (50m + 25m + 10m + 0m) / 4 = 21.25m$. Intensive land uses are not buffers, e.g. active row cropping, recently abandoned fields, paved areas, housing developments, unfenced pasture, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s). Select one, or double check up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone (if any).		
7pts	VERY LOW. 2 nd growth or older forest, prairie, savannah, wildlife area, etc.	
5pts	LOW. Old field (>10 yrs), shrubland, young 2 nd growth forest, etc.	X
3pts	MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field, etc.	X
1pt	HIGH. urban, industrial, open pasture, row cropping, mining, construction, etc.	

13

subtotal

13

subtotal from previous page

Metric 3. Hydrology. Maximum 30 points. This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.		
3a. Sources of Water. Select all that apply and sum score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score.		
1pt	100 year floodplain. "Floodplain" is defined in OAC Rule 3745-1-50(P) as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	1
1pt	between stream/lake and other human land use. This question asks whether the wetland is located <u>between</u> a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	part of wetland or upland (e.g. forest, prairie) complex. Both this and the next question ask whether the wetland is in physical proximity to, or a part of either nearby wetland or upland natural areas. The difference is whether the area the wetland is "long and narrow" like a river, or more "squareish" like a large forest or woodlot. If the latter is the case, this question applies; if the former, the next question applies. In a few instances, both may apply.	
1pt	part of riparian or upland corridor. See description above.	
3c. Maximum water depth. Select only one and assign score. The Rater does <i>not</i> need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	2
1pt	<0.4m (<15.7in)	
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of secondary indicators is necessary and expected in order to properly answer this Question. Categories correspond to Zones II, III, and IV of 1987 Manual (Table 5). Zone IV subdivided into seasonally inundated and seasonally saturated.		
4pts	Semipermanently to permanently inundated or saturated.	4
3pts	Regularly inundated or saturated.	
2pts	Seasonally inundated.	
1pt	Seasonally saturated in the upper 30cm (12in) of soil.	

24

subtotal

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the Rater to evaluate the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

It is very important to stress that this question does not discriminate between wetlands with different types of hydrologic regimes, e.g. between a forested seep wetland located on a floodplain with seasonal inundation and a leatherleaf (*Chamaedaphne calyculata*) bog with precipitation and minor amounts of surface run-off from a small watershed. Rather, it asks the rater to evaluate the "intactness" of the hydrologic regime attributable to *that type of wetland*. In the example above, both the forested seep wetland and the leatherleaf bog can score the maximum points (12) if there no, or no apparent, modifications to the natural hydrologic regime.

Once the Rater has listed all possible past and ongoing disturbances, the Rater should check the most appropriate category to describe the present state of the wetland. In instances where the Rater believes that a wetland falls between two categories, or where the Rater is uncertain as to which category is appropriate, it is appropriate to "double check" and average the score.

The labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a hydrologic disturbance continuum, from very high to very low or no disturbance.

The Rater may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

<input checked="" type="checkbox"/>	ditch(es), in or near the wetland	point source discharges to the (non-stormwater)
<input type="checkbox"/>	fill(s), in or near the wetland	filling/grading activities in or near the wetland
<input type="checkbox"/>	dike(s), in or near the wetland	road beds/RR beds in or near the wetland
<input type="checkbox"/>	weir(s), in or near the wetland	dredging activities in or near the wetland
<input type="checkbox"/>	stormwater inputs (addition of water)	<input checked="" type="checkbox"/> other (specify) <i>Bolivar Dam</i>

Circle one answer. Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime, or have they occurred so far in the past that current hydrology should be considered to be "natural"?	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Double check "none or none apparent" and "recovered" and assign a score of 9.5.
Select one or double check adjoining numbers and average the score.			score
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the rater.		
7pts	RECOVERED. The wetland appears to have recovered from past modifications.		<i>7</i>
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.		
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.		

subtotal from previous page

<p>Metric 4. Habitat Alteration and Development. Maximum 20 points. While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. This metric attempts to evaluate these things under the rubric "habitat alteration." In many instances, items checked as possible hydrologic disturbances in Question 3e will be instead alterations to a wetland's habitat or disruptions in its development (successional state). In other instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. In any case, the Rater should carefully consider what is the actual proximate (direct) cause of the disturbance to the wetland.</p>			
<p>4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.</p> <p>Examples of substrate/soil disturbance include filling and grading, plowing, grazing (hooves), vehicle use (motorbikes, off-road vehicles, construction vehicles), sedimentation, dredging, and other mechanical disturbances to the surface substrates or soils.</p>			
<p>Circle one answer. Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils or substrates, or have they occurred so far in the past that current conditions should be considered to be "natural"?</p>	<p>YES</p> <p>Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.</p>	<p>NO</p> <p>Assign a score of 4 since there are no or no apparent modifications.</p>	<p>NOT SURE</p> <p>Double check "none or none apparent" and "recovered" and assign a score of 3.5.</p>
<p>Select one or double check adjoining numbers and average the score.</p>			<p>score</p>
4pts	NONE OR NONE APPARENT. There are no disturbances, or no disturbances apparent to the Rater.		
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.		3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.		
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.		
<p>4b. Habitat development. Select only one and assign score. This question asks the Rater to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically or hydrogeomorphically similar wetlands. This question presumes a good sense of the types of wetlands and the range in quality typical of the region, watershed, or state.</p>			
7pts	EXCELLENT. Wetland appears to represent the best of its type or class.		
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.		6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.		
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.		
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.		
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.		
1pt	POOR. Wetland appears to <u>not</u> be a good example of its type or class because of past or present disturbances, successional state, etc.		

subtotal

40

subtotal from previous page

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetland's overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. In some instances, the scores can be viewed as a habitat alteration continuum, from very high to very low or no disturbance. The Rater may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.

Check all that are observed present in or near the wetland.

<input checked="" type="checkbox"/>	Mowing	Herbaceous layer/aquatic bed removal
<input type="checkbox"/>	Grazing (cattle, sheep, pigs, etc.)	Sedimentation
<input type="checkbox"/>	Clearcutting	Dredging
<input type="checkbox"/>	Selective cutting	Farming
<input type="checkbox"/>	Woody debris removal	Nutrient enrichment, e.g. nuisance algae
<input type="checkbox"/>	Toxic pollutants	Other (specify)
<input type="checkbox"/>	Shrub/sapling removal	Other (specify)

<p>Circle one answer. Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat, or have occurred so far in the past that current habitat should be considered to be "natural"?</p>	<p>YES</p> <p>Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.</p>	<p>NO</p> <p>Assign a score of 9 since there are no or no apparent modifications.</p>	<p>NOT SURE</p> <p>Double check "none or none apparent" and "recovered" and assign a score of 7.5.</p>

Select one score or double check adjoining numbers and average the score.		
9pts	NONE OR NONE APPARENT. There are no alterations, or no alterations that are apparent to the Rater.	<input checked="" type="checkbox"/>
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	<input checked="" type="checkbox"/>
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

} 7.5

<p>Metric 5. Special wetland communities. Maximum 10 points. Assign or deduct points if wetland has the feature described. Refer to Narrative Rating for guidance. No wetland can receive more than 10 points even if multiple categories are applicable.</p>		score
Bog (10 pts)	Lake plains sand prairies (Oak Openings) (10 pts)	
Fen (10 pts)	Relict wet prairies (10 pts)	
Old Growth Forest (10 pts)	Known occurrence of threatened/endangered species (10 pts)	
Mature Forested Wetland (5 pts)	Significant migratory songbird/waterfowl habitat (10 pts)	
Coastal wetlands, unrestricted hydrology (10 pts)	Category 1 wetlands (See Narrative Rating #5) (-10 pts)	
Coastal wetlands, restricted hydrology (5 pts)		

47.5

subtotal

47.5

subtotal from previous page

Metric 8. Vegetation, Interspersion, and Microtopography. Maximum 20 points.		
<p>8a. Wetland Vegetation Communities. Check each community present <u>both vertically and horizontally</u> within the wetland with an area of at least 0.1 hectares or 1000m² (0.2471 acres). Assign a score of 0 to 3 using Tables 3, Table 4 or Table 5. Sum the scores for the classes present.</p>		
X	<p>Aquatic Bed. Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (<i>Lemna</i> spp., <i>Spirodela</i> spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.</p>	1
X	<p>Emergent. Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, fens, prairie pothole, and bluejoint slough.</p>	2
X	<p>Shrub. Includes areas of wetlands dominated by woody vegetation less than 6m (20 ft) tall. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.</p>	2
X	<p>Forested. Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are defined as "vernal pools" in OAC Rule 3745-1-50.</p>	2
	<p>Mudflats. The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB₃) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.</p>	
	<p>Open water. The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas re 1) inundated, 2) unvegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.</p>	
	<p>Other (See User's Manual)</p>	

Table 3. Use this table to assign a cover score for Metric 8a to each of the vegetation communities identified on the preceding page. Refer to Table 6 for narrative descriptions of what "low," "moderate," and "high" quality mean.

Cover score	Description
0	the vegetation community is either: 1) absent from wetland, or 2) comprises less than 0.1ha (0.2471 acres) of contiguous area within the wetland
1	vegetation community is present and either: 1) comprises a small part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation, the community is of low quality
2	the vegetation community is present and either: 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	the vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation.

Table 4. Use this table in conjunction with Table 5 to determine what is a "low," "moderate," or "high" quality community.

narrative	description
low	low species diversity and/or a predominance of non-native or disturbance tolerant native species
moderate	native species are the dominant component of the vegetation, although non-native or disturbance tolerant native species can also be present, and species diversity is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species
high	a predominance of native species, with non-native species absent or virtually absent, and high species diversity and sometimes, but not always, the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

54.5

subtotal

54.5

subtotal from previous page

8b. Horizontal (plan view) interspersal. Select only one and assign score. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.		
5pts	HIGH. Wetland has a high degree of interspersal.	
4pts	MODERATELY HIGH. Wetland has a moderately high degree of interspersal.	
3pts	MODERATE. Wetland has a moderate degree of interspersal.	
2pts	MODERATELY LOW. Wetland has a moderately low degree of interspersal.	
1pt	LOW. Wetland has a low degree of interspersal.	1
0pts	NONE. Wetland has no plan view interspersal.	

8c. Coverage of Invasive Plant Species. Refer to Table 1 on Page 7 for list. Select only one and assign score.		
-5pts	Extensive. >75% areal cover of invasive species	
-3pts	Moderate 25-75% areal cover of invasive species	
-1pt	Sparse. 5-25% areal cover of invasive species	-1
0pts	Nearly absent. <5% areal cover of invasive species	
1pt	Absent.	

8d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopographic habitat features often present in wetlands.		
Vegetated hummocks and tussocks.		
Coarse woody debris >15cm (6in) in diameter		2
Standing dead trees >25cm (10in) diameter at breast height		1
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction.		2

Table 6. Cover scale for microtopographic habitat features.

microtopographic habitat quality	verbal description
0	feature is absent or functionally absent from the wetland
1	feature is present in the wetland in very small amounts or if more common, of low quality
2	feature is 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

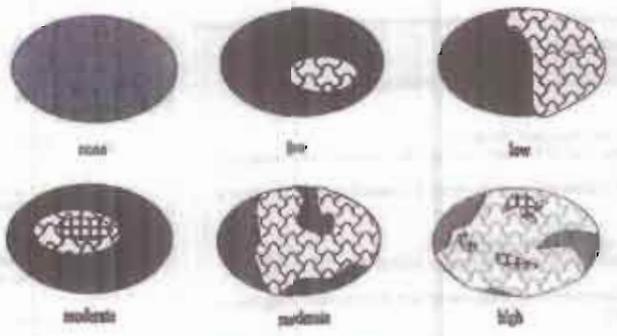


Figure 1. Hypothetical wetlands for estimating degree of interspersal.

59.5

GRAND TOTAL

End of Quantitative Rating. Complete Categorization Worksheets.
 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/daw/401/401.html>

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 1.
	Question 6. Bogs	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 7. Fens	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted.	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
Question 10. Oak Openings	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	11	
	Metric 3. Hydrology	18	
	Metric 4. Habitat	16.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersed, microtopography	12	
	TOTAL SCORE Consult most recent score calibration report at http://www.epa.state.oh.us/dnr/401/401.htm to determine the wetland's category based on its quantitative score.	59.5	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

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

Final Category

Choose one	Category 1	Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Bolivar Dam

Upland Species, Area 1, 2, 3, 4, 5

Species	Common Name	Type	Size	Comments
<i>Pinus strobus</i>	White Pine	Tree	52, 43, 48 dbh	
<i>Populus deltoides</i>	Eastern Cottonwood	Tree		
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree		
<i>Carpinus caroliniana</i>	American Hornbeam	Tree	15, 20, 14, 11 dbh	
<i>Sassafras albidum</i>	Sassafras	Tree		
<i>Acer negundo</i>	Box Elder	Tree		
<i>Acer rubrum</i>	Red Maple	Tree	31 dbh	
<i>Acer saccharinum</i>	Silver Maple	Tree		
<i>Maclura pomifera</i>	Osage-orange	Tree		
<i>Ulmus americana</i>	American Elm	Tree		
<i>Platanus occidentalis</i>	Sycamore	Tree		
<i>Carya ovata</i>	Shagbark Hickory	Tree		
<i>Carya lacinjosa</i>	Shellbark Hickory	Tree	39, 39, 38, 32, 30, 12, 16 dbh	
<i>Morus rubra</i>	Mulberry	Tree		
<i>Quercus rubra</i>	Red Oak	Tree	52, 91, 74 dbh	
<i>Juglans nigra</i>	Black Walnut	Tree		
<i>Quercus palustris</i>	Pin Oak	Tree		
<i>Quercus alba</i>	White Oak	Tree	25, 58, 61 dbh	
<i>Prunus serotina</i>	Black Cherry	Sapling	12 ft	
<i>Quercus rubra</i>	Red Oak	Sapling	12 ft	
<i>Ulmus americana</i>	American Elm	Sapling	3 ft, 6 ft	
<i>Fraxinus pennsylvanica</i>	Green Ash	Sapling		
<i>Lonicera x bella</i>	Honeysuckle	Shrub	3 ft, 5 ft, 6 ft	
<i>Alliaria petiolata</i>	Garlic mustard	herb		
<i>Verbesina alternifolia</i>	Wingstem	herb		
<i>Geum canadense</i>	White avens	herb		
<i>Leersia oryzoides</i>	Rice cutgrass	herb		
<i>Phalaris arundinacea</i>	Reed canary grass	herb		
<i>Ageratina altissima</i>	White Snakeroot	herb		

<i>Sanicula marilandica</i>	Black Snake-Root	herb			
<i>Fragaria</i> spp.	Strawberry	herb			
<i>Viola</i> spp.	Violet	herb			
<i>Aquilegia canadensis</i>	Wild Columbine	herb			
<i>Phytolacca americana</i>	Pokeweed	herb	7 ft		
<i>Rumex crispus</i>	Curly Dock	herb			
<i>Cirsium vulgare</i>	Thistle	herb			
<i>Taraxacum officinale</i>	Dandelion	herb			
<i>Trifolium pratense</i>	Red Clover	herb			
<i>Urtica procera</i>	Tall nettle	herb	1.5 ft		
<i>Polygonum sagittatum</i>	Arrow-leaf tearthumb	herb			
<i>Lobelia</i> spp.	lobelia sp.	herb			
<i>Vernonia gigantea</i>	Ironweed	herb			
<i>Persicaria vulgaris</i>	Lady's thumb	herb			
<i>Solidago gigantea</i>	Late goldenrod	herb	1 ft		
<i>Equisetum arvense</i>	Horsetail	herb			
<i>Dichanthelium clandestinum</i>	Deer tongue grass	herb			
<i>Toxicodendron radicans</i>	Poison Ivy	herb			
<i>Aster lateriflorus</i>	Calico aster	herb			
<i>Pilea pumila</i>	Cleanweed	herb			
<i>Elymus canadensis</i>	Wild-rye	herb	2 ft		
<i>Dactylis glomerata</i>	Orchard Grass	herb			
<i>Ludwigia</i> spp.	Seedbox	herb			
<i>Polygonum</i> spp.	White polygonum	herb			
<i>Lysimachia nummularia</i>	Creeping Jennie	herb			
<i>Solidago canadensis</i>	Canada goldenrod	herb			
<i>Carex intumescens</i>	Greater bladder sedge	herb			
<i>Aster vinosus</i>	Small white aster	herb			
<i>Onclea sensibilis</i>	Sensitive fern	fern			
<i>Dryopteris spinulosa</i>	Spinulose woodfern	fern			
<i>Polystichum acrostichoides</i>	Christmas Fern	fern			
<i>Vitis riparia</i>	Grape	vine			
<i>Toxicodendron radicans</i>	Poison Ivy	vine	6 dbh		
<i>Rubus</i> spp.	Blackberry	vine	6 ft		
<i>Lonicera japonica</i>	Japanese Honeysuckle	vine			
<i>Rosa multiflora</i>	Multiflora rose	vine			
<i>Smilax rotundifolia</i>	Greenbrier	vine	3 ft, 5 ft, 6 ft		

Wetland Species, Area 2

Species	Common Name	Type	Size	Comments
<i>Fraxinus pennsylvanica</i>	Green Ash	tree		
<i>Ulmus americana</i>	American Elm	tree		
<i>Acer negundo</i>	Box Elder	sapling		
<i>Salix nigra</i>	Black Willow	sapling		
<i>Lysimachia nummularia</i>	Creeping Jennie	herb		
<i>Phalaris arundinacea</i>	Reed canary grass	herb		

Old Field Species, Spoil Area

Species	Common Name	Type	Size	Comments
<i>Celtis occidentalis</i>	Hackberry	Tree	9 ft	
<i>Elaeagnus umbellata</i>	Autumn Olive	Tree	10 ft	
<i>Morus alba</i>	White Mulberry	Tree		on ridge
<i>Allanthus altissima</i>	Tree-of-Heaven	Tree	20, 17, 12, 8 dbh	on ridge
<i>Prunus serotina</i>	Black Cherry	Tree		on ridge
<i>Acer negundo</i>	Box Elder	Tree		on ridge
<i>Quercus palustris</i>	Pin Oak	Tree		on ridge
<i>Quercus alba</i>	White Oak	Tree		on ridge
<i>Nyssa sylvatica</i>	Tupelo	Tree		on ridge
<i>Rhus glabra</i>	Smooth Sumac	Shrub	5 ft	
<i>Lonicera x bella</i>	Honeysuckle	Shrub	4 ft	
<i>Solidago altissima</i>	Tall Goldenrod	Herb	7 ft	
<i>Daucus carota</i>	Queen Annes Lace	Herb	40 in	

Botanical Survey/Vegetation Data

VEGETATION PLOT DATA FORM

Site: Bolivar Dam, Stark and Tuscarawas Counties, Ohio
 Date: 15 November 2007 4m X 4m: yes
 Plot No.: T4a, Forested Upland on Hillside, Areas 3 and 4 1m X 1m: yes



Species	Common Name	Percent Coverage
Trees		
<i>Carya laciniosa</i>	Shellbark Hickory	1 tree
<i>Pinus strobus</i>	White Pine	90 %
Saplings		
<i>Carpinus caroliniana</i>	American Hornbeam	1 sapling (5 %)
<i>Quercus alba</i>	White Oak	2 saplings
Herbaceous		
<i>Viola spp.</i>	Violet	30 %
<i>Rubus spp.</i>	Raspberry	15 %
<i>Solidago spp.</i>	Goldenrod	1 %
<i>Poa spp.</i>	Grass	20 %

* Indicates dominant species.

Percent area of exposed soil: None, ground covered with leaf litter.

Percent area of standing water: None

Depth of standing water: None

Maximum plant height / size: Mature Forest, Shellbark dbh 38 inches, White Pine dbh 52, 43, and 48 inches.

Note signs of vegetation stress/mortality: None

Observed wildlife species: White-tailed deer scat and trails, squirrel nests, woodpecker holes,

Some Indiana bat habitat.

Comments or additional notes: _____

VEGETATION PLOT DATA FORM

Site: Bolivar Dam, Stark and Tuscarawas Counties, Ohio
 Date: 15 November 2007 4m X 4m: yes
 Plot No.: T4b, Forested Upland on Hillside, Areas 3 and 4 1m X 1m: yes



Species	Common Name	Percent Coverage
Trees		
<i>Acer rubrum</i>	Red Maple	1 tree
<i>Carya laciniosa</i>	Shellbark Hickory	80 %
Vines		
<i>Lonicera japonica</i>	Japanese Honeysuckle	2 vines (1 %)
<i>Rubus spp.</i>	Raspberry	1 vine (5 %)
<i>Toxicodendron radicans</i>	Poison Ivy	6 inches dbh
Herbaceous		
<i>Viola spp.</i>	Violet	5 %
<i>Poa spp.</i>	Grass	25 %
<i>Aquilegia canadensis</i>	Wild Columbine	15 %

* Indicates dominant species.

Percent area of exposed soil: None, ground covered with leaf litter.

Percent area of standing water: None

Depth of standing water: None

Maximum plant height / size: Mature Forest.

Note signs of vegetation stress/mortality: None

Observed wildlife species: White-tailed deer scat and trails, squirrel nests, woodpecker holes,

Some Indiana bat habitat.

Comments or additional notes: _____

VEGETATION PLOT DATA FORM

Site: Bolivar Dam, Stark and Tuscarawas Counties, Ohio

Date: 15 November 2007

Plot No.: T4c, Forested Upland on Hillside, Area 5

4m X 4m: yes

1m X 1m: yes



Species	Common Name	Percent Coverage
Trees		
<i>Carya laciniosa</i>	Shellbark Hickory	6 trees (40 %)
<i>Quercus alba</i>	White Oak	6 trees (50 %)
<i>Prunus serotina</i>	Black Cherry	10 %
Vines		
<i>Smilax rotundifolia</i>	Greenbrier	10 %
<i>Rubus spp.</i>	Raspberry	10 %
<i>Toxicodendron radicans</i>	Poison Ivy	1 vine
Shrubs		
<i>Lonicera x bella</i>	Honeysuckle	10 %
Herbaceous		
<i>Viola spp.</i>	Violet	5 %
<i>Poa sp.</i>	Grass	25 %
<i>Fragaria spp.</i>	Strawberry	1 %
<i>Alliaria petiolata</i>	Garlic Mustard	2 %

* Indicates dominant species.

Percent area of exposed soil: None, ground covered with leaf litter.

Percent area of standing water: None

Depth of standing water: None

Maximum plant height / size: Mature Forest, Shellbark dbh 12 and 16 inches, White Oak dbh 58 and 61 inches, Black Cherry 12 ft tall, Greenbrier, Raspberry, and Honeysuckle 6 ft tall.

Note signs of vegetation stress/mortality: None

Observed wildlife species: White-tailed deer scat and trails, squirrel nests, woodpecker holes,

Some Indiana bat habitat.

Comments or additional notes: Forest with moderately thick understory.

VEGETATION PLOT DATA FORM

Site: Bolivar Dam, Stark and Tuscarawas Counties, Ohio

Date: 15 November 2007

Plot No.: T5a, Old Field Vegetation, Spoil Area

4m X 4m:

yes

1m X 1m:

yes



Species	Common Name	Percent Coverage
Herbaceous		
<i>Solidago altissima</i>	Tall Goldenrod	60 %
<i>Verbascum thapsus</i>	Common mullein	5 %
<i>Daucus carota</i>	Queen Annes Lace	2 %
<i>Oenothera Biennis</i>	Evening Primrose	2 %
<i>Lepidium campestre</i>	Cow Cress	1 %
<i>Aster dumosus</i>	Bushy Aster	2 %
<i>Panicum virgatum</i>	Switchgrass	3 %

* Indicates dominant species.

Percent area of exposed soil: 40 %, sand and gravel exposed.

Percent area of standing water: None

Depth of standing water: None

Maximum plant height / size: Old field growth. Goldenrod 4 to 5 ft tall and Switchgrass 4 ft tall.

Note signs of vegetation stress/mortality: None

Observed wildlife species: White-tailed deer beds and trails, small rodents, rabbit scat.

Comments or additional notes: In valley of old quarry area.

VEGETATION PLOT DATA FORM

Site: Bolivar Dam, Stark and Tuscarawas Counties, Ohio
 Date: 15 November 2007 4m X 4m: yes
 Plot No.: T5b, Old Field Vegetation, Spoil Area Ridge 1m X 1m: yes



Species	Common Name	Indicator Status
Trees and Shrubs		
<i>Prunus serotina</i>	Black Cherry	25 %
<i>Elaeagnus umbellata</i>	Autumn Olive	5 %
<i>Lonicera x bella</i>	Honeysuckle	3 %
Vines		
<i>Rubus spp.</i>	Raspberry	15 %
<i>Rosa multiflora</i>	Multa Flora Rose	15 %
<i>Lonicera japonica</i>	Japanese Honeysuckle	5 %
Herbaceous		
<i>Viola spp.</i>	Violet	10 %
<i>Mentha arvensis</i>	Mint	2 %
<i>Solidago altissima</i>	Tall Goldenrod	10 %

* Indicates dominant species.

Percent area of exposed soil: None, ground covered with leaf litter.

Percent area of standing water: None

Depth of standing water: None

Maximum plant height / size: Mature Forest, Autumn Olive and Honeysuckle 7 ft tall, Cherry tree 11 in. dbh.

Note signs of vegetation stress/mortality: None

Observed wildlife species: White-tailed deer trails.

Comments or additional notes: Ridge area of old quarry.

Correspondence



Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR

SEAN D. LOGAN, DIRECTOR

Division of Natural Areas and Preserves
Steven D. Maurer, Chief
2045 Morse Rd., Bldg. F-1
Columbus, OH 43229-6693
Phone: (614) 265-6453; Fax: (614) 267-3096

November 27, 2007

Mitzy Schaney
Burgess & Niple, Inc.
5085 Reed Rd.
Columbus, OH 43220

Dear Ms. Schaney:

I have reviewed our Natural Heritage maps and files for the three US Army Corps of Engineers Dam Safety Program project areas at the Beach City Dam in Franklin Township, Tuscarawas County and on the Navarre Quad; the Mohawk Dam in Jefferson Township, Coshocton County and on the Warsaw Quad; and at the Bolivar Dam in Pike Township, Stark County and on the Bolivar Quad (45057). The numbers/letters on the list below correspond to the areas marked on the accompanying map. Common name, scientific name and status are given for each species. Status codes are defined as: E=endangered, T=threatened, SC=species of concern and FE=federal endangered.

Warsaw Quad

1. *Cyprogenia stegaria* - Fanshell, E, FE
Cryptobranchus alleganiensis - Eastern Hellbender, E
Plethobasus cyphus - Sheepsnose, E
Quadrula cylindrica cylindrica - Rabbitsfoot, E
2. *Fusconaia maculata maculata* - Long-solid, E
3. *Etheostoma camurum* - Bluebreast Darter, T
Cryptobranchus alleganiensis - Eastern Hellbender, E
Plethobasus cyphus - Sheepsnose, E
Quadrula cylindrica cylindrica - Rabbitsfoot, E
Fusconaia maculata maculata - Long-solid, E
Cyprogenia stegaria - Fanshell, E, FE
4. *Etheostoma camurum* - Bluebreast Darter, T
Ammocrypta pellucida - Eastern Sand Darter, SC

There are no state nature preserves at any of the three project sites. We are also unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state parks, state forests or state wildlife areas in any of the three project areas.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas.

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

Sincerely,

Debbie Woischke, Ecological Analyst
Natural Heritage Program



Schaney, Mitzy

From: Ayaay, Jonathan J LRH [Jonathan.J.Ayaay@lrh01.usace.army.mil]
Sent: Thursday, November 29, 2007 8:51 AM
To: Schaney, Mitzy
Subject: FW: Bolivar Dam safety improvement measures

See e-mail from USFWS below

Jonathan J. Aya-ay
Planning Branch
Huntington District
U.S. Army Corps of Engineers
Tel: (304) 399-5872
Cell: (304) 638-3602
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E-mail: jonathan.j.ayaay@usace.army.mil

-----Original Message-----

From: Jeromy_Applegate@fws.gov [mailto:Jeromy_Applegate@fws.gov]
Sent: Monday, October 16, 2006 11:58 AM
To: Ayaay, Jonathan J LRH
Subject: Bolivar Dam safety improvement measures

Hello Jay,

This e-mail follows our on-site review of the subject project on October 10, 2006. During this site review, we walked portions of the project where tree clearing is proposed to occur, in order to determine the potential effects of interim tree clearing and subsequent corrective measures (installation of filter mat, etc.) on the Federally endangered Indiana bat (*Myotis sodalis*).

Available suitable habitat for the Indiana bat at the site consisted of early successional wooded areas as well as an approximately 15-acre woodlot composed of moderately mature mixed hardwood and conifer tree species.

This 15-acre woodlot had a maintained, open understory. The early-successional wooded areas were characterized by a fairly dense understory. Some suitable roosting habitat was present in the wooded areas on site, although the number and quality of these roosts did not appear to provide high-quality roosting habitat for a maternity colony of Indiana bats. Sandy Creek and its backwaters flow through the project site, and could provide suitable foraging habitat for the Indiana bat.

To avoid adverse impacts to the Indiana bat, the Service recommends that:

1. Tree clearing be limited along the backwater areas identified during our site visit. A wooded buffer of at least 30 feet in width should be maintained to help preserve the quality of the backwater areas for foraging Indiana bats. Shrubs and multiflora rose can be cleared in this 30-foot buffer without adverse effects to the species.
2. Any unavoidable tree clearing at the site be conducted only between September 15, and April 15, when Indiana bats would not be present.

I do not anticipate any impacts to other Federally listed species as a result of the proposed dam safety improvement measures.

During our site visit we observed areas of standing water and hydrophytic vegetation. The Service recommends that these areas be examined for the potential presence of jurisdictional wetlands before proceeding with project activities.

Feel free to contact me with any questions.

Sincerely,

Jeromy Applegate
Fish and Wildlife Biologist
U S Fish and Wildlife Service
6950 Americana Parkway, Suite H
Reynoldsburg, OH 43068
614-469-6923 ext. 21
614-469-6919 (FAX)

