ENVIRONMENTAL INVESTIGATIONS AT THE PADUCAH GASEOUS DIFFUSION PLANT AND SURROUNDING AREA McCRACKEN COUNTY, KENTUCKY

VOLUME II

WETLANDS INVESTIGATION

Prepared by

Department of the Army
Waterways Experiment Station, Corps of Engineers
Environmental Laboratory
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Engineer District Nashville
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Volume 2 of 5

May 1994
Final Report

Prepared for

Department of Energy
Oak Ridge Operations
Paducah Site Office
P.O. Box 1410
Paducah, KY 42001

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Conversion Factors, Non-SI to SI Units of Measurement

Non-SI units of measurement used in this report can be converted to SI units as follows:

Multiply	By	To Obtain
acres	0.405	hectares
feet	0.3048	meters
inches	2.540	centimeters
miles	1.609347	kilometers
square feet	0.093	square meters

Contents

Preface

This document provides results of one of four studies conducted to describe environmentally sensitive areas near the Paducah Gaseous Diffusion Plant properties at Paducah, Kentucky. This report presents the methods and results of the identification and delineation of jurisdictional wetlands on the Department of Energy and Tennessee Valley Authority reservations and selected areas not included as part of either reservation. A planning level wetland identification, delineation, and characterization of wetlands, and analysis of results are discussed.

The work was performed by the U.S. Army Engineer Waterways Experiment Station (WES). The report was prepared by Messrs. Robert W. Lichvar and Russell F. Pringle. Assistance in compiling the report was received from Dr. Steve Sprecher and Mr. Scott Marler. Messrs. Robert W. Lichvar, Scott Marler and Dr. Steve Sprecher are from the Wetlands Branch of the Environmental Laboratory (EL), WES, and Mr. Russell F. Pringle is detailed to WES by the U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS). Dr. M. R. Kress was the WES project coordinator.

The work was conducted under the direct supervision of Mr. Ellis J. Clairain, Jr., Acting Chief of the Wetlands Branch. General supervision for the study was provided by Mr. Carl Brown, Acting Chief, Ecological Research Division, EL, and Dr. John Harrison, Director, EL.

The purpose of the WES environmental investigations was to support PGDP's National Environmental Policy Act (NEPA) compliance program. These investigations provide current information about environmentally sensitive areas on the PGDP reservation and support the development of environmental impact statements planned for the PGDP site. These investigations also support current DOE regulations (10 CFR 1022) which implement Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands), and support DOE to comply with Section 106 of the National Historic Preservation Act and the Endangered Species Act of 1973.

The results of the environmental investigation are presented in five volumes as follows:

Volume I: Executive Summary
Volume II: Wetlands Investigation
Volume III: Threatened and Endangered Species Investigation
Volume IV: Cultural Resources Investigation
Volume V: Floodplain Investigation

Director of WES during the preparation of this document was Dr. Robert W. Whalin. Commander was COL Bruce K. Howard.

1 Introduction

Paducah Gaseous Diffusion Plant Study Area Description

The Paducah Gaseous Diffusion Plant (PGDP) study area is located in the extreme western part of the state of Kentucky in a region referred to as the Jackson Purchase. The Jackson Purchase includes eight counties: Ballard, Calloway, Fulton, Graves, Hickman, Marshall, and McCracken (Figure 1). The study site is located in McCracken County about 32 km (20 miles) east of the confluence of the Ohio and Mississippi Rivers.

Climate

The PGDP is located in the humid continental zone. Temperatures for the summer months average 29.4°C (85°F), while winter temperatures average 2.2°C (36°F). During the winter months, temperatures will drop below freezing an average of 60 nights and 10 days (Humphrey 1976). The summers are warm and humid, with an average of 40 days of 32.2°C (90°F) or higher per year. The growing season ranges from 175 to 220 days, based on first and last frost (Humphrey 1976).

Precipitation is distributed relatively evenly throughout the year and averages 113 cm (44.5 inches) per year (Humphrey 1976, CH2M Hill 1992). A third of the precipitation occurs during March through May. October is the driest month, with an average of 6.6 cm (2.6 inches) of rain. The mean annual precipitation due to snowfall is less than 2.54 cm (1 inch). Prevailing winds are normally from the southwest; calm periods are seldom longer than 24 hours (Humphrey 1976).

Topography and Geology

The PGDP is located at the northeast end of the Mississippi Embayment, a part of the Coastal Plain Province (Fenneman 1938). The Mississippi Embayment synclinal trough is characterized by unconsolidated sediments

overlying a consolidated Paleozoic basement complex. In the vicinity of the PGDP, the bedrock surface occurs at depths of about 106.7 m (350 feet) (Speece et al. 1991). Tertiary and Cretaceous alluvium, loess, and continental deposits dip gently towards the axis of the trough and cover the Paleozoic basement complex (Olive 1972).

The study area is estimated to be 4,746 ha (11,719 acres) in size (Figure 2). Within the study area, two main topographic features dominant the landscape: the loess covered plains at an average elevation of 118.87 m (390 feet), and the Ohio River floodplain zone at an average elevation of 96.01 m (315 feet) above sea level. The loess occurs throughout most of the upland plain. Alluvium dominates the Ohio River floodplain region and the bottom of the larger tributaries (Humphrey 1976).

Surface-Water Hydrology

The PGDP study area is located in the western portion of the Ohio River basin within the drainage areas of Big Bayou and Little Bayou Creeks (CH2M Hill, Site Investigation Report 1992). Located along the western boundary of the area, Big Bayou Creek is a perennial stream with a drainage area of 48.17 km^2 (18.6 square miles). Little Bayou Creek originates within the PGDP reservation and flows northward to the Ohio River. The drainage area of Little Bayou Creek is 22.02 km^2 (8.5 square miles).

Other surface water bodies located within the PGDP study area include the Ohio River, Metropolis Lake, numerous small ponds and gravel pits, settling basins, and ditches that may receive discharges from the PGDP plant.

2 Objectives

The purpose of this study is to identify the location, types, and acreages of wetlands distributed on the study area. Wetlands were delineated and mapped at the planning level. A planning level wetland delineation is defined as the identification of wetlands that meet the jurisdictional requirements under Section 404 of the Clean Water Act, and locating them to the nearest contour interval on a base map as accurately as possible without formal surveying techniques. PGDP will use the wetlands location information to develop remediation measures to deal with contaminant plumes and to comply with the National Environmental Policy Act (NEPA) requirements.

Additionally, objectives for the planning level wetland delineation report included the following items (each item is referenced to its location in the report):

a. Maps of all delineated wetlands (Appendix D).

b. Approximate acreage of all delineated wetlands (Table 4) (Figure 4).

c. A discussion of all dominant plant species in each stratum of each type of wetland delineated and their wetland plant indicator status (Section 4, Vegetation) (Figure 4).

d. A discussion of the hydrology of each wetland type delineated and data used to make determinations if the wetlands met the hydrology parameter (Section 4, Soils, Vegetation) (Appendix B).

e. A discussion of the hydric soils associated with each wetland type and their field characteristics (Section 4, Soils).

f. All field data and notes (Appendix B).

g. A discussion of previously disturbed wetland sites, if applicable (Section 4, Human Disturbances to Wetlands).

h. Literature cited and/or bibliography (References).

i. A list of individuals and organizations contacted (Section 3, Knowledgeable Individuals).

3 Methodology

A planning level wetland delineation was conducted in the field during late 1992 and early 1993. Potential wetland locations at the PGDP site were assessed using existing resource information, including 1990 aerial photographs, soils maps, U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI) maps, topographic maps and selected literature and PGDP reports. Wetlands were located, sampled and mapped in the field during three separate field visits and later digitized into a Geographic Information System (GIS) for display on a wetland baseline map. Each of these procedures is described in detail below.

Resources Information

USGS topographic maps

The PGDP study area is located on the Joppa, Illinois-Kentucky, and Heath, Kentucky, topographic maps published by the U.S. Geologic Survey in 1982 and 1978, respectively. The scale of these maps is 1:24,000. Water courses and wet depressions that were mapped on the AutoCAD generated map by CH2M Hill (1992) were transferred into a GIS wetland baseline map file.

National wetlands inventory maps (NWI)

NWI maps for this site were obtained in both hard and digital format. The digital data were entered onto the GIS baseline map file for the study area. The NWI maps were developed in 1988 using 1983 Color IR aerial photographs. All symbols recorded on the NWI maps were labelled according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) (Table 1).

Ballard and McCracken County soil survey

Soils on the PGDP study area are described in the Soil Survey of Ballard and McCracken Counties, Kentucky (Humphrey 1976). The study area is

located on map sheets 4, 8, 9, 10, and 15. Mapping units for each soil series were entered into the GIS baseline map in digital format. To determine which soil series were considered hydric or non-hydric with hydric inclusions, a list of hydric soils of Kentucky was obtained from the U.S Department of Agriculture, Soil Conservation Service (SCS) field office in Paducah, Kentucky.

During the week of December 7, 1992, soils mapped for this site in the county soil survey were evaluated on site. It was determined that soil designations in the county soil survey map were accurate. Also, it was determined that many of the large areas of hydric soils did not contain wetlands and the soil map units would have limited use in locating wetlands.

Aerial photography

The black and white, spring 1990, 1:9,000 (1"=750') aerial photographs furnished by PGDP were evaluated in the field during the week of December 7, 1992. These leaf-off photographs showed ponded water and water saturated soils in many areas. During the ground-truthing of the photos, each major vegetation type was briefly characterized in the field for later use in the laboratory. During this field visit, soils were saturated from winter rains. These winter conditions were determined to be similar to the hydrologic conditions represented by the aerial photographs.

The 1990 aerial photographs evaluated in the field during December 1992 were later used in the laboratory to identify potential wetlands. Using a magnifying stereoscope with stereo pairs, areas appearing to pond water were delineated on the photographs. These included streams, water bodies, drainageways, or other areas of ponded water. Delineations were checked, verified or corrected in the laboratory by a separate investigator. The delineated areas on the aerial photographs were then located on the baseline map by using common ground control points. These locations were then georeferenced and digitized into the GIS wetland baseline map file.

Knowledgeable Individuals

Information about vegetation, rare species, unique plant communities and wetlands was obtained from several individuals and organizations. Information about vegetation and rare plant and plant communities for the site was obtained from Mr. Mark Evans, Botanist, and Ms. Laurel McNeil, Data Manager for Kentucky State Nature Preserves Commission (KSNPC). A list of species and plant communities was received from the KSNPC in addition to a partial copy of *Biological Inventory of the Jackson Purchase Region of Kentucky* (Kentucky State Nature Preserves Commission 1991). Also, Ms. Joyce Bender of KSNPC guided a field tour of Metropolis Lake during the December, 1992, field visit. During this visit, Ms. Bender provided information about seasonal water levels at the lake.

Mr. Charles Logsden of West Kentucky Wildlife Management Area (WKWMA) provided information about wetlands, prairies and rare species. Additionally, Mr. Logsden provided information on seasonal ponding of water throughout the upper plain terrace and the Ohio River floodplain. On several occasions he escorted the investigators to locations of rare plant species and several mesic prairies. He provided copies of the *Timber Wildlife Management Plan for Area 6, West Kentucky Wildlife Management Area* (Bureau of Natural Resources) and a copy of the *Vegetation Landcover Map* done by Janet Jones, a student at Murray State University, for the wildlife management area.

Dr. Thomas Heineke, private consultant, was contacted for vegetation information for the site. Dr. Heineke's dissertation, *The Flora and Plant Communities of the Middle Mississippi River Valley* (1987), included the PGDP site within its study region. Dr. Heineke provided suggestions about local floras available in this area and where to obtain copies of literature about the historical vegetation of the Purchase Area in Kentucky.

Ray Hedrick and Kim Cross of the U.S. Army Engineer District, Nashville, Tennessee, provided a site orientation and a tour of the study area. They also provided information about hydrology and vegetation in the area.

Mr. Donald Purvis, Chief of Regulatory, U.S. Army Engineer District, Louisville, Kentucky, was contacted for comments about the methodology for a planning level delineation. The Louisville District, as directed by the Corps of Engineers (COE) headquarters in Washington, requires jurisdictional delineations to be performed using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Since the wetland delineation in this study is being performed at the planning level and is not intended to represent jurisdictional boundaries, Mr. Purvis had no objection to the proposed methodology. He suggested we coordinate in the future with Mr. Jerry Sparks in their local field office, who agreed with the comments by Mr. Purvis. Mr. Sparks provided references for local and regional vegetation literature.

Literature search

A limited literature search was performed for this project. Nationally, wetland occurrence data are published in the format of NWI maps by the U.S. Fish and Wildlife Service (FWS). Therefore, most of the literature reviewed pertained to geology, soils, historical vegetation, ecological information about plant communities or floristic data for the region. These references will be cited in the appropriate sections.

GIS Wetland Baseline Map

Digital baseline map

A baseline wetland map was developed using AutoCAD and ArcINFO programs. The topographic, vegetation, and cultural features, based upon previous work by CH2M Hill, were used as a digital base in the AutoCAD system. The NWI information was entered into the baseline file in digital format and corrected with ArcINFO. The soil series distribution data from the Ballard and McCracken County Soil Survey for the site were digitized by personnel at U.S. Army Engineer Waterways Experiment Station (WES) and entered into the baseline map file.

Wetlands resource data

Information on wetland classification and occurrence data from the NWI maps, location of soil map units that are hydric or non-hydric with hydric inclusions, and additional hydrological information relative to the floodplains were recorded on the wetland baseline map.

Field wetlands baseline maps

For wetland field inventory purposes, 79 maps were made for the study area. These maps were developed at two scales: 1:2,100 and 1:1,700. These maps depicted contours, roads, waterways, and wetland interpretations from aerial photography. The contour intervals of these maps were 2 and 1 foot respectively. These map scales allowed for fairly accurate field mapping of wetlands.

Wetland Field Study

Wetland definition

The U.S. Army Corps of Engineers regulates specific activities in waters of the United States under Section 404 of the Clean Water Act. Section 404 of this Act regulates the discharge of dredged or fill materials into waters of the United States (U.S.). Waters of the U.S. are defined as oceans, lakes, rivers, streams, playas, and other special aquatic sites, including wetlands (33 CFR 328.3). Certain water bodies, which are clearly exempted from regulation under Section 404, include artificial ponds and lakes used for such purposes as stock watering and settling basins, drainage ditches excavated on dry land, and excavated pits with water until they are abandoned (33 CFR 328.3). Wetlands by law are defined as: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically

adapted for life in saturated soil conditions" (33 CFR 328.3 (b)). The methods for identifying and delineating jurisdictional wetlands are outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). This delineation also used techniques presented in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989).

Besides wetland requirements under Section 404 of the Clean Water Act, all Federal agencies are required to avoid all adverse impacts to wetlands under Executive Order 11990. This Executive Order (10 CFR 1022) is addressed under NEPA documentation. The requirements under these Executive Orders are beyond the scope of this study and will not be addressed.

This report identifies several different types of wetlands and water bodies, including deep water habitat, wetlands, and artificial water bodies. Deep water habitats are areas where the water is greater than 6.6 feet deep (Cowardin et al. 1979). These areas are regulated as "Waters of the United States." Deep water habitats are included in the open water cover type in this report. This type includes part of the Ohio River and the larger ponds and lakes. Wetlands that meet the criteria under the 1987 and 1989 manuals are identified and mapped. Linear wetlands in this report refer to intermittent streams. Also, mapped are artificial water bodies that are exempt from Section 404 regulations associated with cooling and settling basins for the coal-powered power plant and PGDP. These water bodies, labeled "open water," are included in this report for the purpose of providing a complete inventory of known surface water resources within the area.

Ditches were not surveyed or mapped as wetlands in this report. Efforts to do so exceed the scope of this study because ditches are treated separately in the regulations. Maintenance of existing ditches for farming activities is exempt according to 33 CFR 323.4.a.3. Under Section 404 f, discharge of fill materials into ditches for maintenance is exempted. Also, those drainage ditches cut through upland areas that lack one parameter of a wetland are not considered regulated (33 CFR 328.3). Further, existing ditches cut through hydric soils with hydrophytic vegetation are wetlands; those lacking hydrophytic vegetation are not wetlands but are considered "Waters of the United States." Because the soil survey map unit boundaries were not verified as part of this study, especially the hydric soils boundaries, no drainage ditches are evaluated for jurisdictional purposes.

Wetland parameters

Wetlands are identified by three different parameters: (1) hydrophytic vegetation, (2) hydric soils and (3) wetland hydrology. Hydrophytic vegetation is determined by sampling the vegetation to establish whether the dominants are wetland species. Dominants were determined by using the 20 percent rule as defined in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989).

That procedure is as follows: for each stratum (e.g., tree, shrub and herb) in each plant community, dominant species are the most abundant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50 percent of the total dominance measure (e.g., basal area or areal coverage) for the stratum, plus any additional species comprising 20 percent or more of the total dominance measure for the stratum. All dominants are treated equally in determining the presence of hydrophytic vegetation. Cover estimates per species at each sample point were established by ocular estimates made within a 9.1 m (30 foot) sampling radius. Plant species determined to be dominants according to this method are then assigned a wetland plant indicator rating from the *National List of Plant Species that Occur in Wetlands: Northeast (Region 1)* (Reed 1988). When 50 percent of the dominants were wetland plant species, the vegetation was considered to be hydrophytic.

Hydric soils are defined as soils that are "saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part" (U.S.D.A. Soil Conservation Service 1991). In general, hydric soils are flooded, ponded or saturated for usually one week or more during the period when soil temperatures are above biological zero (5°C) (41°F) as defined in *Soil Taxonomy* (U.S.D.A. Soil Survey Staff 1975). Additionally, the National Technical Committee for Hydric Soils (NTCHS) has identified field indicators of hydric soils including soil colors, organic content, sulfidic materials, iron or manganese concretions and organic streaking. Soil samples were taken at each sample point using a standard tubular soil probe pushed to depth of 45.7 cm (18 inches). Using the NTCHS field characteristics, soil samples were evaluated for hydric conditions.

Wetland hydrology is defined by terms of permanent or periodic inundation, or saturation to the soil surface, at least seasonally, and is the driving force behind wetland formation (Federal Interagency Committee for Wetland Delineation 1989). The presence of water for a week or more typically creates anaerobic conditions in the soil, which affect the types of vegetation and soils that develop on a site. Numerous factors influence the wetness of an area, including precipitation, stratigraphy, topography, soil permeability and plant cover. Water in a wetland can come from precipitation, overbank flooding, surface runoff or ground water discharge. Field indicators for identification of wetlands include visual observations of ponding or saturated soils, oxidized root channels, water marks, drift lines, sediment deposits, water-stained leaves, drainage patterns and morphological plant adaptations. These field characteristics were used to evaluate each wetlands hydrologic condition.

Characterization of wetland types

Initial field reconnaissance of the area estimated over 500 possible wetland occurrences within the study area. Sampling and characterizing each individual wetland would have produced hundreds of field data sheets and a very large number of redundant descriptions. To provide for a concise analysis and

written description of each wetland, it was decided that wetlands would be characterized by a classification system of vegetation cover types. This descriptive system would meet field inventory needs and provide for a reasonable presentation of wetland distribution data.

A stratified sampling approach was used to characterize the wetlands at a planning level at PGDP. To maximize the resources allocated to the characterization of wetlands, the study area was divided into three major geographic sub zones. Within each of these sub zones, wetlands were sampled based on the selection of representative sample points and an attempt to distribute them evenly throughout the area. Each wetland not sampled was visited in the field, characterized by cover type, and mapped to the nearest contour line. Later, the development of the cover type classification and characterization of wetlands relied on the synthesis of the sampling data. The most used variables were the abundance values for plant species, vegetation strata, soils, and hydrology within each type.

Sampling schedule

For the purposes of locating, sampling and mapping wetlands, a sampling schedule and protocol were developed to provide sufficient coverage. The site was divided into three large blocks: southern, middle and northern tiers. The northern block is depicted on map sheets 1 thru 4, the middle block on map sheets 5 thru 8, and the southern block on map sheets 9 thru 13 (Appendix D).

Each of these blocks was sampled and mapped in the field during a one-week period. The sampling periods were the weeks of March 1, April 5, and May 10, 1993. Sampling began in the southern area and proceeded north to the Ohio River. Because many of the altered and problematic wetland areas occur in the southern block, it was sampled first during the early spring. Sampling early in the spring allowed for use of hydrology observations to locate wetlands. Also, the use of observable hydrology assisted in making decisions on problematic wetlands and their extent. The northern block, which contains the floodplain of the Ohio River, was sampled last. The reasons for this approach were twofold: (1) wetlands in the floodplain area were determined to be easier to identify later in the growing season, and (2) high water during spring flooding would prevent sampling until after the water levels had dropped.

Sampling protocol

The routine wetland identification method, discussed in both the COE 1987 and the combined Federal 1989 manuals, was used to sample and organize the field data. Briefly, this method involves the observer walking the entire area, identifying the plant communities, selecting representative observation points, characterizing the plant community, recording indicator status of dominant species, determining whether hydrophytic vegetation is present, evaluating

wetland hydrologic indicators, determining whether hydrology is present, characterizing the soils, determining whether soils are hydric, and making a wetland determination. Sixty-four representative sample points were taken within the study area. Each of these sample points was located on the baseline map and is shown on the wetlands map (Appendix D). The field data collected at each sample point during the study are presented in Appendix B. Note that no data were collected for sample points 52 through 54.

During the wetland delineation, a vascular plant species list was compiled (Appendix A). This list represents species observed during the sampling of wetlands and reported in the *Biological Inventory of the Jackson Purchase Region of Kentucky* (Kentucky State Nature Preserves Commission 1991). Voucher specimens for 26 species were collected. This checklist represents occurrence but not location data. Because the checklist was compiled during early to late spring growing season, it is composed mostly of species identifiable during that period. Habitat descriptions for species in a checklist for Calloway County, Kentucky, were used to compare occurrences at the study site (Woods and Fuller 1988). The PGDP species checklist is arranged alphabetically by family and genus under the groupings of ferns, monocots and dicots. Synonymy follows the *Vascular Plants of Kentucky* (Browne and Athey 1992).

Orientation in the field

To sample all potential areas for wetlands, both wetland field indicators and field experience of the investigators were used to orient searches. Since hydric soils or nonhydric with hydric inclusions occur on 79 percent of the site and extensive human modification have occurred at the site, they were not considered a good field indicator (Table 2). Search images for potential areas with wetlands were obtained from a combination of other field indicators and resource materials depicted on the GIS baseline field maps. These included areas that had been identified as potential wetlands on the aerial photographs, drainage patterns, ponded water, mapped areas with water symbols, areas with little slope, and depressional areas.

In the field, each of the 12 baseline maps was further divided into about 60.7 ha (150 acre) sections. Accessible areas adjacent to roads were sampled and mapped during short hikes. Because the majority of each section was not accessible from a road, surveys of the remainder of the area were performed by long distance hiking. Field maps and aerial photographs were carried during each hike to guide the direction of the wetlands search. Approximately 97-113 km (60-70 miles) were hiked during this phase.

Mapping

When wetlands were located, they were mapped on the field wetland baseline map. Each wetland was located on the baseline map by positioning it in

relationship to topography and, if possible, to other features such as roads and streams. Each wetland was mapped as a polygon and labelled. Narrow streams that were not large enough to map as wetland polygons were designated as linear features. Many wetlands were not mapped to the nearest contour line because they were located on slopes or because their boundaries did not match the shape of the contour lines. The wetland maps represent an effort to identify wetland boundaries as closely as possible in the field by ocular estimates.

Field team

The field team for this study consisted of Robert W. Lichvar, Botanist, and Russell F. Pringle, Soil Scientist. Mr. Lichvar is from the Wetlands Branch of the Environmental Laboratory, U.S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi. Mr. Pringle, during this study, was detailed to WES by the U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS).

4 Characterization of Wetlands

This section discusses (a) soils found in the study area wetlands, (b) wetland vegetation communities, (c) remnant natural areas, and (d) areas of human disturbance to wetlands. Wetland characteristics and distributions are described in the sections on soil and vegetation. Hydrology is included and described in both the vegetation and soil sections. Descriptions are provided for two unique areas discovered during this survey. Also, human impacts to wetlands are described in a separate section.

Soils

Soils of the Mississippi Embayment are a mixture of well-drained to poorly-drained silt, clay or sandy loams. Well-drained and deep-silt loams are located along the loess slopes and plains located south of the Ohio River floodplain. The floodplains, including stream terraces, typically are comprised of well-drained to poorly-drained silt loams, gravel or sands. Erosion and siltation from historically poor farming practices are problematic in this region of Kentucky (Kentucky Soil and Water Conservation Commission 1982).

Soils on the study area are described in the *Soil Survey of Ballard and McCracken Counties, Kentucky* (Humphrey 1976). The site is located on map sheets 4, 8, 9, 10, and 15. Within the study area, 30 different map units were recorded and mapped in the county soil survey. Of the thirty map units that occur here, eighteen have the potential of supporting the occurrence of wetlands. These eighteen potential wetland map units, which represent 79 percent of the study area, are divided into three groups: (1) those that are listed as hydric in *Hydric Soils of the United States* (USDA SCS 1991) (2) those that are listed by the USDA SCS Kentucky office as hydric because they occur below 96.62 m (317 feet) elevation along the Ohio River, and (3) those listed as non-hydric with hydric inclusions in the county (Table 2). The four soil map units listed as hydric are Henry, Rosebloom, Waverly and miscellaneous map unit Swamp. The soil series listed for McCracken County as non-hydric with hydric inclusions are Arkabutla, Calloway, Dundee, Falaya-Collins and Newark-Lindside. The soils listed for McCracken County as hydric due to

flooding when located below 96.62 m (317 feet) elevation along the Ohio River are Alluvial Land, Brandon, Chavies, Dubbs, Grenada, Nolin, Nolin-Robinsonville and Vicksburg.

Described below are the hydric soil map units that comprise greater than 5 percent of the study area that are either hydric soils, non-hydric soils with hydric inclusion or soils considered hydric when located below 96.62 m (317 feet) elevation along the Ohio River.

Calloway silt loam (CaA)

This shallow to moderately deep, somewhat poorly drained soil is located on 0 to 2 percent slopes on slightly concave uplands and stream terraces. It formed in alluvium derived dominantly from loess.

Typically, the surface layer is dark grayish brown (10YR 4/2) silt loam with light brownish gray (10YR 6/2) mottles about 20.3 cm (8 inches) thick. The upper part of the subsoil to a depth of 66.04 cm (26 inches) is light yellowish brown (10YR 6/4), yellowish brown (10YR 6/2), and light brownish gray (10YR 6/2) silt loam with mottles of gray (10YR 5/1) and brown (7.5YR 5/3). The subsoil below this to a depth of 152.4 cm (60 inches) is a firm, compact, gray (10YR 6/1) silty clay loam brittle fragipan with mottles of brown (7.5YR 5/3) and gray (10YR 5/1).

Permeability is moderate to a depth of about 66.04 cm (26 inches) and slow below. Available water capacity is moderate with a seasonal high water table at a depth of 15.2 to 45.7 cm (6 to 18 inches) from late winter to early spring. Runoff is slow, and the hazard of erosion is slight.

Included with this soil in mapping are small areas of Grenada and Henry soils.

The Calloway silt loam (CaA) soil map unit comprises 669.63 ha (1,654 acres) within the study area. This soil was located at the following sample points: 7, 13, 20, 38 and 43 (Table 8). The vegetation cover types most commonly associated with this soil at the site were Flood Plain-Oak (FP-O) and Agriculture (AG) (Table 9).

Calloway silt loam (CaB)

This soil map unit is located at the upper end of natural drainages and is similar in most respects to Calloway silt loam (CaA). The difference is that it is located on mostly 2 to 3 percent slopes with about a 7.62 cm (3 inch) thick surface layer.

The Calloway silt loam (CaB) soil map unit occurs on 424.53 ha (1,049 acres) of the study area. This soil map unit was located at sample

points 4, 17, 31 and 33 (Table 8). The vegetation communities associated with this soil unit were the Wet Meadow/Grassland (WM/GL) and Plain Forest-Oak (PF-O) (Table 9).

Falaya-Collins silt loam (Fc)

This map unit is located on floodplains along creeks on 0 to 2 percent slopes. These soils are mapped together as a complex because their mixed patterns make separation impractical at the scale used in mapping. Falaya soils make up about 60 percent of the complex and Collins soils 25 percent. In some areas either soil can make up as much as 85 percent. Collins soils are generally nearer to the channel than Falaya soils. The Falaya soil is very deep and somewhat poorly drained. The Collins soil is very deep and moderately well drained. They formed in alluvium derived mainly from loess.

Typically, the Falaya surface layer is about 20.3 cm (8 inches) thick and is a brown (10YR 4/3) silt loam with few grayish brown (10YR 4/3) mottles. The subsoil to a depth of 40.64 cm (16 inches) is dark grayish brown (10YR 4/2) silt loam with light brownish gray (10YR 6/2) mottles. Below this to a depth of more than 152.4 cm (60 inches) is gray (2.5Y 5/1) silt loam with light yellowish brown (10YR 6/4) and dark grayish brown (10YR 4/2) mottles.

Typically, the Collins surface layer is brown (10YR 4/3) silt loam about 22.86 cm (9 inches) thick. Below this to a depth of 152.4 cm (60 inches) the subsoil and substratum are grey (10YR 5/3 and 10YR 4/3) silt loam with light brownish gray (10YR 6/2), pale brown (10YR 6/3) and yellowish brown (10YR 5/6) mottles.

Permeability is moderate in this map unit. Available water capacity is high with a seasonal high water table at a depth of 15.2 to 45.7 cm (6 to 18 inches) from late winter to early spring. Runoff is slow, and the hazard of water erosion is slight. Falaya soils are frequently flooded for long periods from December to April. Collins soils are frequently flooded for long to very long periods from January to April.

Included with this soil in mapping are small areas of Calloway, Grenada, Loring, Vicksburg, and Waverly soils.

The Falaya-Collins silt loam (Fc) soil map unit comprised 324.57 ha (802 acres) within the PGDP study area. This soil was located at sample points 36, 39, 40, 41, 46, 50, 51, 63, and 66 (Table 8). The vegetation cover types most commonly associated with this soil at the site were Flood Plain-Birch (FP-B) and Flood Plain-Tupelo (FP-T) (Table 9).

Grenada silt loam (GrB3)

This map unit is located on side slopes of terraces along creeks and rivers with 2 to 6 percent slopes. These soils formed in loess on relatively smooth uplands and in alluvium washed from loess on stream terraces.

Typically, the surface layer is brown (10YR 4/3) silt loam about 22.86 cm (9 inches) thick. The upper part of the subsoil to a depth of 66.04 cm (26 inches) is light yellowish brown (10YR 6/4) with faint pale brown (10YR 6/3) mottles. Below this to a depth of 152.4 cm (60 inches) the subsoil is a compact, brittle fragipan of brown (10YR 5/4) silt loam with light gray (10YR 7/1) and pale brown (10YR 6/3) mottles.

Permeability is moderate to the fragipan and slow through the pan. Available water capacity is low with a seasonal high water table perched on the pan from January to July. Runoff is moderate to high, and the hazard of erosion is high.

Included with this soil in mapping are small areas where gravel or sand layers are less than 121.92 cm (48 inches) below the surface, and areas where the alluvial or colluvial soils are located along natural drainageways.

The Grenada silt loam (GrB3) soil map unit comprised 1,273 acres within the PGDP study area. This soil was located at sample points 9, 14 and 23 (Table 8). The vegetation cover types most commonly associated with this soil unit at the site were Plain Forest-Cottonwood (PF-C), Plain Forest-Oak (PF-O), and Man Made (MM) (Table 9).

Henry silt loam (Hn)

This map unit is located on nearly level uplands and stream terraces on 0 to 2 percent slopes. It is moderately deep and poorly drained and formed in thick deposits of loess or alluvium.

Typically, the surface layer is grayish brown (10YR 5/2) silt loam with light brownish gray (10YR 6/2) mottles about 20.3 cm (8 inches) thick. The subsurface layer to a depth of 66.04 cm (26 inches) is gray or light gray (10YR 6/1) silt loam with brownish yellow (10YR 6/6) mottles. Below this to a depth of 152.4 cm (60 inches) is a compact, brittle fragipan of gray (10YR 6/1) silty clay loam that is mottled with strong shades of brown (7.5YR 5/6).

Permeability is moderate to the fragipan and slow through the pan. Available water capacity is low with a seasonal high water table at a depth of 0 to 15.2 cm (0 to 6 inches) from December to April. Runoff is slow, and the hazard of erosion is slight.

Included with this soil in mapping are small areas of Calloway, Chavies, Okaw, Saffell, and Wheeling soils.

The Henry silt loam (Hn) soil map unit comprised 832.97 ha (2,058.27 acres) within the PGDP study site. This soil was located at sample points 1, 2, 3, 5, 6, 8, 19, 25, 26, 28, 29, 30, 32, 34, 35, 37, 44, 45, 47 and 48 (Table 8). The vegetation cover types most commonly associated with this soil type at the site were Plain Forest-Oak (PF-O), Plain Forest-Maple (PF-M), Vernal Pools (VP), and Wet Meadow/Grassland (WM/GL) (Table 9).

Rosebloom silt loam (Ro)

This nearly level, poorly drained soil is located on 0 to 2 percent slopes on lower floodplains. It formed in alluvium derived from loess.

Typically, the surface layer is dark-gray (10YR 4/1) silt loam about 17.78 cm (7 inches) thick. The upper part of the subsoil to a depth of 132.08 cm (52 inches) is light gray (10YR 7/1) silt loam. Below this to a depth of 60 inches is a gray (10YR 6/1) silty clay loam with light brownish gray (10YR 6/2) mottles.

Permeability is slow. Available water capacity is high with a seasonal high water table to the surface during the spring and summer.

Included with this soil in mapping are small areas of Alligator, Arkabutla, Sharkey and Waverly soils.

The Rosebloom silt loam (Ro) soil map unit comprised 21.4 ha (53 acres) within the PGDP study site. This soil was not located at any sample points. The vegetation cover type most commonly associated with this soil at the site was Floodplain-Tupelo (FP-T) (Table 9).

Swamp (Sw)

This map unit is located in level areas that are under water most of the year. Because of continued ponding of water on this soil, the USDA SCS did not provide technical description of soils in this mapping unit. However, it was noted that the soils are heavy silty clay loam that are gray (10YR 5/1), white (10YR 8/1) or bluish (5B 6/1).

The Swamp (Sw) map unit comprised 69.61 ha (172 acres) of the PGDP study site. This map unit was located at sample points 61 (Table 8). The vegetation cover types most commonly associated with this soil at the site were the Swamp (SW) and Plain Forest-Maple (PF-M) (Table 9).

Vicksburg silt loam (Vb)

This well-drained, nearly level soil is located on floodplains of stream branches and creeks on 0 to 2 percent slopes. It was formed in sediments washed mainly from loess.

Typically, the surface layer is brown (10YR 5/3) silt loam about 20.3 cm (8 inches) thick. The upper part of the subsoil to a depth of 73.66 cm (29 inches) is dark brown (10YR 4/3) silt loam. The subsoil below this to a depth of 152.4 cm (60 inches) is brown (10YR 4/3) loam.

Permeability is moderate. Available water capacity is high with a seasonal high water table at a depth of 60.96 cm (24 inches) in the spring.

Included with this soil in mapping are small areas of Cascilla, Collins, and Falaya soils.

The Vicksburg silt loam (Vb) soil map unit comprised 212.47 (525 acres) of the PGDP study site. This soil was located at sample points 10, 11, 18, 21, 22, 27, 42 and 64 (Table 8). The vegetation cover types most commonly associated with this soil at the site were Plain Forest-Farmed (PF-F) and Plain Forest-Birch (PF-B) (Table 9).

Waverly silt loam (Wa)

This poorly drained, nearly level soil is on floodplains of larger creeks on 0 to 2 percent slopes. It formed in sediments washed mainly from loess.

Typically, the surface layer is grayish brown (10YR 5/2) silt loam about 17.78 cm (7 inches) thick. The upper part of the subsoil to a depth of 124.46 cm (49 inches) is light gray (10YR 7/1) silt loam. The subsoil below this to a depth of 177.8 cm (70 inches) is mottled light gray (10YR 7/1) yellowish brown (10YR 5/6) silt loam.

Permeability is moderate. Available water capacity is high with a seasonal high water table present at 0 to 15.2 cm (0 to 6 inches) in the spring.

Included with this soil in mapping are small areas of Arkabutla, Falaya, and Rosebloom soils.

The Waverly silt loam (WA) soil map unit comprised 9.71 ha (24 acres) of the PGDP study area. This soil map unit was not located at sample points. The vegetation cover types most commonly associated with this soil at the site were Vernal Pool (VP) and Plain Forest-Oak (PF-O) (Table 9).

Vegetation

Plant community information is presented in a hierarchal classification of plant associations and cover types. Plant associations denote the major "climax" unit or formation of vegetation (Braun 1950, Greller 1988). Each association represents a certain continuity throughout its extent, including (1) some uniformity of species composition, (2) uniformity of physiognomy, and (3) historical or genetic origin. Some examples of plant association types in the eastern deciduous forest are Mixed Mesophytic, Oak-Hickory or Beech-Maple.

Following major events such as fire, logging, farming, or other human or natural disturbances, vegetation progresses through a series of plant communities (seral communities) toward the climax community (Daubenmire 1952). This process, called succession, is a continuous one but is usually divided into five classes: the disturbance, early, mid, late, and climax stage. These five classes are called cover types (Despain 1990). In this study, wetland vegetation is characterized and assigned a cover type based on the dominant species cover data gathered during the delineation.

The PGDP study area is dominated by three major plant associations plus numerous open water areas and agricultural lands. The plant associations are bottomland hardwood forests, Oak-Hickory flats, and prairie grasslands. The bottomland forests are located on the older terraces and floodplain ridges along the Ohio River and the lower reaches of Big Bayou and Little Bayou creeks. These areas are dominated by such species as Sugarberry (*Celtis laevigatis*), Sweetgum (*Liquidambar styraciflua*), Cherrybark Oak (*Quercus falcata* var. *pagodifolia*), Pin Oak (*Q. palustris*), Willow Oak (*Q. phellos*), and Cottonwood (*Populus deltoides*). Associated within this vegetation type are several sloughs and swamps with Bald Cypress (*Taxodium distichum*) and Water Tupelo (*Nyssa aquatica*).

Scattered in the plains region of the site are several remnant prairie grasslands. These are mesic type prairie grasslands. Dominant species associated with this type are Big Bluestem (*Andropogon gerardii*), Little Bluestem (*Schizachyrum scoparium*), Indian Grass (*Sorgastrum nutans*), False Indigo (*Baptisa leucantha*), Black-eyed Susan (*Rudbeckia hirta*), and Rigid Goldenrod (*Solidago rigida*).

By far, the largest plant association within the study site is Oak-Hickory. This association was historically dominated by a variety of Oaks and Hickories (Braun 1950). As a result of past logging and farming activities, the association has many inclusions of Sugar Maple (*Acer saccharum*) and Beech (*Fagus grandifolia*). Within the plains region of the site, older second growth stands of Oak-Hickory dominate several large blocks of land. Drier sites in the plains region have a mixture of Sugar Maple, Beech, White and Red Oak (*Quercus alba* and *Q. rubra*), and several Shagbark Hickories (*Carya cordiformis* and C. *ovata*). In areas with moist soils, species such as River Birch (*Betula nigra*),

Red Maple (*Acer rubra*), American Elm (*Ulmus americana*), and Sycamore (*Platanus occidentalis*) become dominants in the canopy.

Other wetland groups located in the study area besides the large plant associations are open water and agricultural land. Numerous open water areas occur throughout the study area. Many of these areas are natural while others are manmade. These bodies of water are mostly greater than 0.61 ha (1.5 acres) in size and include large manmade ponds, the Ohio River, numerous large dredged channels, Metropolis Lake, settling basins, and some emergent marshes.

Mixed within the three plant associations are large blocks of agricultural lands. Crops are grown for both cash and wildlife forage value. Agricultural fields dedicated to wildlife values are located within the WKWMA. Several different commodity crops are grown within the site, including corn and soy beans. As a result of the agricultural activities and the historical ordinance arsenal, several cover types have developed from these impacts. Specifically, these cover types include wetlands associated with agricultural activities, agricultural and stock ponds, and some emergent marshes, ponds, and settling basins.

As mentioned above, wetlands in this report are characterized and mapped by a classification of vegetation cover types. Cover type information can be gathered rapidly in the field and is compatible with data requirements for a wetland delineation, i.e., ranking of dominants to determine hydrophytic vegetation. Data gathered from representative areas were used to delineate and describe the cover types. Representative sample points are referred to in each cover type discussion (Table 3). Data sheets for each type are attached in Appendix B. The cover types presented below are grouped under the plant association within which they occur in the study area, i.e., Flood Plain-Tupelo type within the bottomland hardwood association.

Several early successional cover types dominated by shrub growth forms of tree species are located in the study area. These areas were not assigned a separate shrub cover type. These shrub areas were described by their dominants and treated as tree forms in the classification. The NWI maps indicated 3 separate scrub/shrub types in the study area. In comparing the locations of these areas to our field data, only the Buttonbush (*Cephalanthus occidentalis*) shrubs commingled with trees along the edge of the swamp type might be considered a scrub/shrub community. This type was not treated separately because of the low cover value of shrubs in relationship to tree species.

A description of the degree of hydrophytic vegetation is included in each cover type. By assigning a numerical rating to each species present in a cover type based on its appropriate indicator status, an average indicator status can be determined. This average, the wetness indicator index, is determined by assigning the numerical value from 1 to 5 for obligate to upland species (Federal Interagency Committee for Wetland Delineation 1989). For example, an obligate is a value of 1, a facultative wet is a 2, facultative is a 3, facultative

upland is a 4, and upland is a 5. The cover types of Open Water (OW) and Vernal Pool (VP) were assigned a value of 1 because no aquatic species were sampled or because they were lacking due to the spring sampling season.

The association between vegetation and the edaphic features of different soils types is well recognized (Whittaker 1975). Because each vegetation cover type and soil mapping unit was entered into the GIS database, the degree of association between each cover type and a soil map unit can be established. An "index of association" between cover types and soil units can be established. The index has values from +1 to -1. Zero indicates no association or the common occurrence between random events established by the Chi-square test (Cole 1949). Positive numerical values show positive association; negative values indicate avoidance. The magnitude of the index represents the strength of the association or avoidance (Table 9).

Bottomland Hardwood Forest

Flood Plain-Birch (FP-B). This type is commonly located in ponded water areas on flood terraces above the main channel. It is mostly located at the lower reaches of the flood plains of Little and Big Bayou Creeks (Appendix C.1 - each cover type photograph and distribution map will be hereafter cited as a decimal point). The mean area size of this type is 1.17 ha (2.9 acres) (Table 4) (Figure 3). This type is dominated by River Birch (*Betula nigra*) with several codominants that vary based on other site features or seral phase. These codominants include Red Maple (*Acer rubrum*), Silver Maple (*Acer saccharinum*) and Red Gum (*Liquidambar styraciflua*). Shrubs associated with this type are usually young saplings of the dominant tree species. The herbaceous layer in this type is sparse and low in diversity. Herbaceous species associated with this type include Fowl Manna Grass (*Glyceria striata*) and Wood Reed (*Cinna arundinacea*). The wetness indicator index for this cover type is 2.875 (Figure 4). Soil series associated with this type are Falaya-Collins and Henry (Table 9). The hydrology of this type varies from overbank flooding to seasonal ponding. Representative sample points for this type are 36, 46, 50, 50 and 56 (Table 3).

Flood Plain-Cottonwood (FP-C). This type is mostly located along the overflow bank of the Ohio River flood plain (Appendix C.2). This type is inundated annually by the river and receives large silt deposits. Its mean area size is 11.21 ha (27.7 acre) (Table 4). This type is dominated by Cottonwood (*Populus deltoides*) and Silver Maple (*Acer saccharinum*). Several codominants occur within this type depending upon the position in the landscape, including Green Ash (*Fraxinus pensylvanica*), Black Willow (*Salix nigra*) and Sugar Berry (*Celtis laevigatus*). The shrub layer is usually dominated by saplings of the same species. The herbaceous layer is dominated by Virginia Knotweed (*Trovaria virginiana)* and False Nettle (*Boehmeria cylindrica*). The wetness indicator index is 2.625 (Figure 4). The soils are typically recent alluvial deposits from the river (Table 9). The hydrology is flowing, overbank

flooding from the Ohio River. The representative sample point for this type is 58 (Table 3).

Flood Plain-Maple (FP-M). This type commonly outlines the boundaries of floodplains of major creeks at their lower reaches, isolated oxbow wetlands, and some larger backwater areas connected to the Ohio River (Appendix C.3). In several areas, this type extends into the upper reaches of the larger creeks. The mean area size of this common type is 3.17 ha (7.83 acres) (Table 4). It is dominated by Silver Maple (*Acer saccharinum*), Green Ash (*Fraxinus pennsylvanica*) and Black Willow (*Salix nigra*). Various codominants increase in frequency depending upon the seral phase including Red Maple (*Acer rubrum*), Black Gum (*Nyssa sylvatica*), and River Birch (*Betula nigra*). The shrub layer is composed of younger individuals of the same dominants. The herbaceous layer is sparse and lacks diversity. Herbaceous species included in this type are Spleenwort (*Asplenium platyneuron*), Poison Ivy (*Rhus radicans*) and Indian Sea Oats (*Chasmanthium latifolium*). The wetness indicator index is 2.167 (Figure 4). Soil series associated with this type are Arkabutla, Wheeling and Calloway (Table 9). These soil series, especially Waverly, are located on floodplains. The hydrology of this type varies from seasonally ponded to perennial connections to the Ohio River. Representative sample points are 24, 60 and 67 (Table 3).

Flood Plain-Oak (FP-O). This type is located on older terraces of less disturbed areas in the Ohio River flood plain and in the upper reaches of Little Bayou Creek (Appendix C.4). This type is located in the low energy flood zones. Bayou Creek Ridge State Natural Area is an example of this type. The mean area size of this type is 3.48 ha (8.60 acres) (Table 4). It is dominated by Cherrybark Oak (*Quercus falcata* var. *pagodifolia*), Green Ash (*Fraxinus pennsylvanica*) and Sugar Berry (*Celtis laevigatus*). Codominants associated with this type are Cottonwood (*Populus deltoides*), Sycamore (*Platanus occidentalis*), Water Locust (*Gleditsia aquatica*), and several Hickories (*Carya ovata*, *C. illinoensis*, and *C. cordiformis*). Shrubs associated with this type include Spice Bush (*Lindera benzoin*), Pawpaw (*Asimina triloba*), and Redbud (*Cercis canadensis*). Herbaceous species found in this type are Wood Nettle (*Laportea canadensis*), Green Dragon (*Arisaema dracontium*), Slyan Bluegrass (*Poa sylvestris*), and Indian Pink (*Spigelia marilandica*). The wetness indicator index is 2.308 (Figure 4). Soil series associated with this type are Brandon and Calloway (Table 9). These soils are typically floodplain soils. Hydrology associated with this type is seasonal flooding from 30.5 to 182.9 cm (12 to 72 inches). Except for the channels, flowing water only moves through this type during spring flooding. Representative sample points are 19, 57 and 59 (Table 3).

Flood Plain-Tupelo (FP-T). This type is located in isolated old flow through channels of the Ohio River (Appendix C.5). The mean area size of this type is 4.2 ha (10.39 acres) (Table 4). This type is dominated by Tupelo (*Nyssa aquatica*), Cherry Bark Oak (*Quercus falcata* var. *pogodifolia*), and Bald Cypress (*Taxodium distchium*). Codominants include Water Hickory (*Carya aquatica*) and Sugar Berry (*Celtis laevigatus*). Buttonbush

(*Cephalanthus occidentalis*) is the most frequently occurring shrub in the understory. The wetness indicator index is 1.666 (Figure 4). The soil series associated with this type are Rosebloom and Falaya-Collins (Table 9). These soils developed from alluvium from ancient flood plains. The hydrology of this type is ponded water throughout most of the year. Representative sample point is 63 (Table 3).

Swamp (SW). This type is located in depressional areas in the Ohio River flood plain and in scattered blocks in the southern section of the plains region (Appendix C.6). Open water areas with dead snags typify the aspect of this type. The mean area is 0.52 ha (1.28 acres) (Table 4). This type is dominated by Buttonbush (*Cephalanthus occidentalis*) and Black Willow (*Salix nigra*). In some areas, Bald Cypress (*Taxodium distichum)* is occasionally observed along with stunted individuals of River Birch (*Betula nigra*), American Elm (*Ulmus americana*), and Green Ash (*Fraxinus pennsylvanica*). Herbaceous plants in this type are usually true aquatic species. Some of these include Duckweed (*Spirodela polyhiza*) and Marsh Seedbox (*Ludwigia palustris*). The wetness indicator index is 1.833 (Figure 4). The soil series associated with this type are Waverly and Henry (Table 9). Both of these soil units are typically flood plain soils that are poorly drained for long periods during the growing season. The hydrology of this type is typically that of ponded to standing water most of the year. Representative sample points are 22, 30, 61, 62 and 65 (Table 3).

Oak-Hickory Plains

Plain Forest-Birch (PF-B). This cover type is situated along smaller stream terraces and in depressional areas that pond water well into the growing season. This type is scattered throughout the plains region with some higher concentrations along creek flood plains (Appendix C.7). The mean area is 0.38 ha (0.95 acres) (Table 4). This type is dominated by River Birch (*Betula nigra*) and Red Maple (*Acer rubrum*). Codominants associated with this type include Red Gum (*Liquidambar styraciflua*), Sycamore (*Plantus occidentalis*) and Cherry Bark Oak (*Quercus falcata* var. *pogodifolia*). Shrubs associated with this type are Sandbar Willow (*Salix exiqua*), Coralberry (*Symphoricarpus orbiculatus*) and American Elm (*Ulmus americana*). Associated vines are Japanese Honeysuckle (*Lonicera japonica*) and River Grape (*Vitis riparia*). Dominant herbaceous species are Fowl Manna Grass (*Glyceria striata*), Bushy Seedbox (*Ludwigia alternifolia*), and Stalk-Grain Sedge (*Carex stipata*). The wetness indicator index is 2.524 (Figure 4). The soil series associated with this type are Vicksburg and Grenada (Table 9). These soils are located along stream terraces, depressional and level areas in the plains region. Hydrology is typically seasonally ponded water from 2.54 to 10.16 cm (1 to 4 inches) in depth. Representative sample points are 9, 11, 21, 27 and 51 (Table 3).

Plain Forest-Cottonwood (PF-C). This type is located in headwater reaches of small tributaries (Appendix C.18). The mean area size of this type is 0.27 ha (0.67 acres) (Table 4). The type is dominated by Cottonwood (*Populus deltoides*) and Pin Oak (*Quercus palustris*). Shrubs are mostly saplings of

the dominant species. The herbaceous layer is dominated by Side Flowered Aster (*Aster latifolius*) and Virginia Rye (*Elymus virginiana*). The wetness indicator index is 2.600 (Figure 4). The soil series associated with this type are Loring and Grenada (Table 9). These soils are usually located along terraces of streams. Seasonal ponding of water to a depth of 30.5 cm (12 inches) can occur until July in this type. The representative sample point is 12 (Table 3).

Plain Forest-Farmed (PF-F). This type is located in the plains region just south of the PGDP (Appendix C.8). This cover type represents abandoned farmlands that have reverted to forests. This type is identified by remnant plow furrows running through the woods along with signs of old drainage efforts. The mean area size is 1.08 ha (2.68 acres) (Table 4). No clear set of dominants describe the canopy of this type. Those major tree species observed include Silver Maple (*Acer saccharinum*), Red Maple (*Acer rubrum*), Cherry-bark Oak (*Quercus falcata* var. *pogodifolia*), River Birch (*Betula nigra*), and Black Gum (*Nyssa sylvatica*). The understory species are sparse in cover and low in diversity. This probably resulted from succession that began as shrubs and saplings. Japanese Honeysuckle (*Lonicera japonica*), and several mosses were characteristic of this layer. The wetness indicator index for this cover type is 2.273 (Figure 4). The soil series associated with this type are Grenada and Vicksburg (Table 9). The hydrology is seasonally ponded water to 4.12 cm (3 inches) into late spring. Representative sample points are 23 and 28 (Table 3).

Plain Forest-Maple (PF-M). This type is scattered throughout the plains region (Appendix C.9). The mean area size of this highly frequently occurring type is 0.32 ha (0.79 acres) (Table 4). This type is dominated by Red Maple (*Acer rubrum*) and Shagbark Hickory (*Carya ovata*). Codominants associated with this type are Cherry Bark Oak (*Quercus falcata* var. *pogodifolia*), Pin Oak (*Q. palustris*) and Black Gum (*Nyssa sylvatica*). Shrubs associated with this type are usually saplings of the dominant trees. The herbaceous layer is sparse in cover and includes Cypress Witch Grass (*Dichanthelium dichotomum*), Fowl Manna Grass (*Glyceria striata*), and Kentucky Fescue (*Festuca aruandinacea*). The wetness indicator index is 2.864 (Figure 4). Associated soil series are Henry and Calloway (Table 9). These soils are typically found in level and depressional areas that are poorly drained. The hydrology of this type is seasonally ponded water to 7.62 cm (3 inches) or saturated soils to the surface. Representative sample points are 1, 8, 10, 18, 31, 32, 37, 38 and 44 (Table 3).

Plain Forest-Oak (PF-O). This type is the wet phase of the Oak-Hickory association. This cover type is scattered throughout the plains region (Appendix C.10). The mean area size of this frequently occurring type is 0.54 ha (1.34 acres) (Table 4). This type is dominated by Cherry Bark Oak (*Quercus falcata* var. *pogodifolia*) and Shagbark Hickory (*Carya ovata*). Several other Oaks and Hickories are codominants, including Pin Oak (*Quercus palustris*), Bur Oak (*Q. macrocarpa*), Swamp Oak (*Q. bicolor*), White Oak (*Q. alba*), Bitternut Hickory (*Carya cordiformis*), and Black Gum (*Nyssa sylvatica*).

Dominant shrubs include Spice Bush (*Lindera benzoin*) and Coral Berry (*Symphoricarpus orbiculatus*). The herbaceous layer is sparse in cover and includes Wood Reed (*Cinna arundinacea*), Japanese Honeysuckle (*Lonicera japonica*), and Virginia Rye Grass (*Elymus virginiana*). The wetness indicator index is 2.538 (Figure 4). The soil series associated with this type are Henry and Grenada (Table 9). The hydrology is seasonal saturation to within 30.5 cm (12 inches) of the surface or ponded water. Representative sample points are 14, 26, 29, 34, 35, 45, 47, 48, and 49 (Table 3).

Vernal Pool (VP). Vernal Pools are defined as areas that have a seasonally perched water table, usually are small in size (3 - 15 m across), are covered by shallow water and retain water long enough to allow some aquatic organisms to grow and reproduce (Zedler 1987, Ikeda and Schlising 1990). This cover type is located along the southeastern and the western edges of the plains region (Appendix C.11). The mean area of these pools was 0.02 ha (0.05 acres) (Table 4). The wetness indicator index is 1.00 (Figure 4). Associated soil series are Henry and Vicksburg (Table 9). Several species of amphibians use these pools in the spring for breeding areas. The following species of organisms have been reported as occurring in these vernal pools: Northern Crawfish, Southern Leopard, and Northern Chorus (Logsden, pers. comm. 1993). No vascular plant species were observed growing in the pools. These small natural pools were observed only in the plains region of the site. The soils were recorded as light gray 10YR 6/1 with strong brown 7.5YR 5/8 mottles indicating that these ephemeral systems occur for a duration long enough to create hydric soils. Water was ponded to a depth of about 60.96 cm (24 inches) in the pools. Representative sample points for this type are 6 and 40 (Table 3). These sites lack hydrophytic vegetation and therefore are not considered jurisdictional wetlands. However, they are considered "Waters of the United States" and are regulated under the Clean Water Act (33 CFR 328.3 (3)).

Prairie Grassland

Wet Meadow/Grassland (WM/GL). This type includes two phases, wet meadows and prairie grasslands. This cover type is more commonly located in the southern half of the study area (Appendix C.12), where it occurs as small wetlands with a mean area of 0.12 ha (0.30 acres) (Table 4). The prairie grassland phase dominated by herbaceous species that historically were maintained by wild fires. Today, the few remaining remnant prairie areas are maintained by burning practices utilized by WKWMA. The prairie grassland species associated with this type are Big Bluestem (*Andropogon gerardii*), Switch Grass (*Panicum virgatum*), Indian Grass (*Sorghastrum nutans*) and Little Bluestem (*Schizachyrium scoparium*). The other phase included in this type is the wet meadow, which is not dominated by native prairie grassland species and represents early phases of succession or areas being maintained by mowing. The wet meadow is dominated by a different assemblage of plants. The dominants of this type include Broom Sedge (*Andropogon virginicus*), Soft Rush (*Juncus effusus*), Fox Sedge (*Carex vulpinoides*), and Sensitive Fern

(*Onoclæa sensibilis*). The wetness indicator index for this cover type is 2.294 (Figure 4). Associated soil series are Grenada and Calloway (Table 9). The hydrology is saturation to the surface or ponding of water to 15.2 cm (6 inches) until late spring. Representative sample points are 17, 33 and 64 (Table 3).

Open Water

Open Water (OW). This type is located throughout the site (Appendix C.13). Under this type are man-made ponds, the Ohio River, numerous large dredged channels, Metropolis Lake, and settling basins. Many of these areas are natural; others are man-made. Open water areas include areas regulated as "Waters of the United States" and man-made settling basins and cooling ponds that are exempt from regulation. Those bodies of water grouped here are mostly greater than 0.61 ha (1.5 acres) in size. The Ohio River beyond the forested shoreline was not mapped in this type. This type is clustered in 4 general areas: the Ohio River flood plain, the plain area north of the plant, settling basin associated with the plant, and the region of the Kentucky Ordinance Disposal (Figure 4). There are no clear dominants to define this type. Beside submersed aquatics, most of the signature vegetation occurs at the margins of these areas. Some species associated with the edge of these areas include Cottonwood (*Populus deltoides*), Black Willow (*Salix nigra*), Reed Grass (*Phragmites australis*), Cattail (*Typha latifolia*), Wool Grass (*Scirpus cyperinus*), Swamp Milkweed (*Asclepias incarnata*), and Soft Rush (*Juncus effusus*). The wetness indicator index is 1.00 (Figure 4). The soils series associated with this type are Grenada and gravel pits (Table 9). The hydrology is standing to slow flowing water. This type differs from man-made land in that the large bodies of water (greater than 2.02 ha (5 acres)) are denoted by this type. Representative sample points are 7 and 16 (Table 3).

Agricultural/Man Made

Agricultural (AG). Found throughout the site (Appendix C.14), this type represents wetlands converted to agriculture. Many of these areas still pond water until early summer. This type represents highly fragmented occurrences of historical wetlands. The wetness indicator index is 2.517 (Figure 4). Of the 247 occurrences of this type, the mean area was only 0.31 ha (0.77 acres) (Table 4). The soil series most frequently associated is Henry (Table 9). No distinction was made within this type for areas that might be considered "Prior Converted" under the Food Security Act and exempt under regulations of Sec. 404 of the CWA (Regulatory Guidance Letter, RGL 90-7). Representative sample points are 2, 3, 5, 41, 42, 43 and 66 (Table 3).

Man Made (MM). This type is located mostly in the southern and northeastern section of the plains region (Appendix C.15). This type can have open water areas but differs from the cover type OW in that it is mostly less than 0.13 ha (0.31 acres) in size (Table 4). This type represents wetlands that

are a result of alterations caused by man from diking, dredging or otherwise created for agricultural or human needs. Most of these created wetlands are dominated by herbaceous species. Some of the species associated with this type include Cattails (*Typha latifolia*), Smooth Rush (*Juncus effusus*), Wool Grass (*Scirpus cyperinus*), Black Willow (*Salix nigra*), and Willow Weed (*Polygonum lapathifolium*). The wetness indicator index is 2.381 (Figure 4). The most frequently associated soil series are Grenada and Calloway (Table 9). The hydrology is typically ponded water well into the summer or even perennial inundation. Representative sample points are 13, 15, 25, and 39 (Table 3).

Natural Areas

Located within the study area are several natural areas that are recognized by Kentucky State Nature Preserves Commission. Sites considered significant by the state include Metropolis Lake State Nature Preserve and Bayou Creek Ridge State Natural Area. The WKWMA is considered notable by the state for habitat for rare species, prairie remnants, and bottomland hardwoods. Each of these areas is discussed in the *Biological Inventory of the Jackson Purchase Region of Kentucky* (Kentucky State Nature Preserves Commission 1991).

During the wetland survey, two relatively undisturbed areas were encountered that warrant noting. These two sites are a mature second growth upland Oak-Hickory forest and a flood plain forest. The mature second growth upland forest, estimated to be 2 to 4 ha (5 to 10 acres) in size, is located south of Bayou Creek on a dry ridge (Appendix C.16). This area probably has been logged at least once in the past but appears not to have been cleared for farming. This historical use of the site has allowed for regeneration of native species in nearly natural arrangement. Dominants up to 91.4 to 101.6 cm (36-40 inches) in diameter at breast height (DBH) include Southern Red Oak (*Quercus falcata*), White Oak (*Q. alba*), Black Oak (*Q. vetulina*), Black Gum (*Nyssa sylvatica*), Shagbark Hickory (*Carya ovata*), Bitternut Hickory (*C. cordiformis*), and Sassafras (*Sassafras albidum*). Understory shrubs were sparse, and several spring ephemerals were observed, including Rue Anemone (*Anemonella thalictroides*) and Mayapple (*Podophyllum peltatum*).

A mature second growth forest was located in the flood plain of Bayou Creek. This flood plain forest was considered to be second growth based on the stature of the forest and counting of tree growth rings. The growth rings of an Oak tree that was cut down adjacent to a paved road were counted. Annual growth rings indicated the tree was about 95 years old (Appendix C.17). Therefore, it is assumed that the area was probably logged once about a century ago. Since that disturbance, the flood plain forest has reforested in a nearly natural condition. The area is estimated to be 2 to 4 ha (5 to 10 acres) in size. The dominants in the forest are Shagbark Hickory (*Carya ovata*), Cherrybark Oak (*Quercus falcata* var. *pogodifolia*), Swamp

Oak (*Q. bicolor*), Hackberry (*Celtis laevigatis*), and Sycamore (*Platanus occidentalis*).

Human Disturbances to Wetlands

As a result of human development, many wetlands in this region and study area have either been lost or altered from their original natural state. Wetland occurrences in Kentucky in the 1780's have been estimated at 633,760.2 ha (1,566,000 acres). Since then, it is estimated that 81 percent of those wetlands have been lost (Dahl 1990). These figures represent a change from 38 percent of the landscape being comprised of wetlands to 1.2 percent.

Disturbances to wetlands observed during this study are presented by categories.

Deforestation and agriculture

At the time of settlement, the Jackson Purchase was greater than 60 percent forested (Kentucky State Nature Preserves Commission 1990). The remainder was covered by extensive prairies (Transeau 1935, Heineke 1987). Today only 24 percent of the Jackson Purchase is forested (Kentucky Soil and Water Conservation Commission 1982). The once extensive prairie regions have been nearly eradicated. Today approximately 53 percent of the Jackson Purchase area is in agriculture (Kentucky State Nature Preserves Commission 1991). As a result of logging and agricultural practices, the entire study area has been either logged or converted to farming. Many previously farmed areas have been abandoned and have reverted to forest. Using the WKWMA Landcover map (Murray State), it is estimated that nearly 50 percent of the site is currently in cropland, pasture, and grasslands.

Stock watering or irrigation ponds

Some wetlands characterized as Man Made (MM) are former ponds that have not been maintained and have reverted to wetlands. Some ponds have been constructed to serve various purposes associated with PGDP and the TVA steam power plant. There are about 60 man-made water impoundments in the study area.

Ditching

Tiling and ditching have occurred in many farmed wetlands. Many of the ditches have not been maintained and have become overgrown with vegetation. Some of the areas mapped as streams or long linear wetlands are remnant ditches. Most roads have drainage ditches adjacent to them. Many of these ditches have areas that appear to have hydrophytic vegetation in them. These

areas have resulted from collection of water in areas of ditches not maintained. However, many of the road ditches bisect wetland areas and partially drained the edges.

Dredging and ditch sidecastings

Large channels and drainage systems are located along the Ohio River near the TVA power plant. Many of the adjacent shorelines are a result of the dredging activities. The cutting and discharge of materials would have had an impact to the original wetlands arrangement in this area. No recent signs of activity were observed.

Gravel pits

In the area of the Kentucky Ordnance Works, many abandoned borrow pits were observed. Many of these were characterized as Open Water or Man Made. Several of these areas are now larger ponds or lakes that provide sport fishing.

Ordnance operation

Southwest of the PGDP is an abandoned ordnance manufacturing area consisting of old buildings, building foundations, and 4 concrete silos. On the north side of the PGDP are remains of about 50 concrete floored and walled ordnance magazines. Some of these magazines are being used by WKWMA for repair shops and storage areas.

5 Delineation Results and Discussion

The NWI maps for the study area reported 583.17 ha (1,441 acres) of wetlands within the area (Table 1). Of these, 135.33 ha (334.4 acres) of the Ohio River were mapped as a limnetic type. By subtracting the limnetic area from the total, the NWI based wetlands size for the study area is 447.6 ha (1,106 acres). Of this, the PFO1A (Palustrine Forest, Broad Leaf Deciduous, Temporarily Flooded) type was the largest wetland type at 265.9 ha (657 acres). This type includes forested areas both in the flood plain and in the plains region. The NWI feature for streams, R2UBH, had reported 8,996.84 m (5.59 miles) of stream length for the site.

This field delineation of wetlands located 1,083 separate wetlands. The total wetlands mapped during the delineation was 639.94 ha (1,581.28 acres), not including the river. This represents a 31 percent increase of wetlands over those reported by the NWI maps. Wetlands therefore comprise 13.64 percent of the study area. Additionally, 65,186.18 m (40.5 miles) of linear streams were mapped within the site (Table 5). This represents a 725 percent increase of reported stream length.

The wetlands delineated during this study were dominated mostly by woody species. Eleven of the sixteen vegetation cover types are dominated by tree or shrub species. Wetlands dominated by woody species comprise 69 percent of the total wetland area. Herbaceous species dominate the Wet Meadow/ Grassland and Agricultural types and comprise 13 percent of the wetland area. The remainder, Open Water, Vernal Pools and Man Made, which are characterized by standing water, comprise the other 17 percent of the wetland area (Table 6) (Figure 5).

The three plant associations and their cover types were located in two physiographic zones, the Ohio River flood plain and the plain region. All the cover types belonging to the Bottomland Hardwoods and Oak-Hickory plant associations were restricted to physiographic regions where they occurred. For example, FP-B, FP-C, FP-M, FP-O, FP-T and SW are only found in the Ohio River flood plain or in the lower most reaches of the larger streams. The Wet Meadow/Grassland (WM/GL) cover type of the Prairie Grassland plant association and the Man Made (MM) cover type were restricted to the plains region.

The Swamp (SW) and Open Water (OW) cover types were scattered throughout the study area. The majority of the Agriculture (AG) cover type was located in the plain region except for limited farming activity in the Ohio River flood plain. Based on these distribution patterns, comparisons of wetlands between the flood plain and plain region will omit the SW and OW cover types.

The wetlands in the Ohio River flood plain are notably larger in size than those found in the plains region. The wetlands in the flood plains have an average mean area of 4.65 ha (11.48 acres), while those located in the plains are 0.395 ha (0.98 acres). The acreage among the sixteen wetland cover types is dominated by 4 cover types: Flood Plain-Cottonwood (FP-C), Flood Plain-Maple (FP-M), Open Water (OW) and Agriculture (AG). Except for portions of the Agricultural type (AG) and Flood Plain-Maple (FP-M), these four cover types are mostly located along the Ohio River flood plain. These four cover types comprised 60 percent of the total wetlands (Table 6). The wetland type with the largest mean area is the Flood Plain-Cottonwood (FP-C) type that is located in the Ohio River flood plain. This cover type has a mean area of 11.21 ha (27.70 acres). This cover type is a large linear block of wetlands adjacent to the river. The next three largest wetlands ranked by mean-area are also found in the Ohio River flood plain: Flood Plain-Maple (FP-M), Flood Plain-Oak (FP-O), and Flood Plain-Tupelo (FP-T).

The most frequently occurring wetland in the study area is the Agricultural type (AG). Twenty-three (23) percent of all wetland occurrences are converted wetlands within agricultural fields (Figure 6) (Table 7). The mean area of this type is 0.31 ha (0.77 acres) (Table 4). With 79.25 percent of the site having either hydric soils or non-hydric map units with hydric inclusions, the implication is that nearly 80 percent of the site historically could have been a wetland. The possible loss of wetlands on this site may be attributed to conversion of 53 percent of Jackson Purchase to agricultural usage (Kentucky State Nature Preserves Commission 1990). These farmed wetlands are obvious in the spring landscape when they have ponded or saturated soils. The difference between the 80 percent historical hydric soils and 13.64 percent of wetlands occurring at the site represent 66.36 percent possible loss of wetlands. These losses began with the earliest European settlement of the area.

The largest non-agricultural wetland cover type in the plains region is the Plain Forest-Oak (PF-O). With 7.96 percent of the total area of wetland in the study area and a 10 percent frequency, this type is the wet phase component of the Oak-Hickory plant association that historically dominated the plains region. The next most common wetland cover type in the plains region is the Plain Forest-Maple (PF-M). This type comprises 6.29 percent of the total wetland area at a frequency of 13.4 percent. This cover type represents a successional seral phase to the Oak-Hickory plant association. Both Sugar and Red Maple increase as components within the canopy of the Oak-Hickory type after extensive logging or farming disturbances. The Plain Forest-Farmed (PF-F) cover type is probably closely related to the PF-M type. The PF-F type had no clear dominants but Red Maple was frequently observed in the canopy. The PF-F is

distinguished from the PF-M by the obvious remnants of farming activity, no specific set of dominant trees species, and lack of a shrub layer. This cover type comprises only 0.51 percent of the wetland area at a frequency of 0.3 percent. The smallest forested cover type was the Plain Forest-Cottonwood (PF-C). Located at the upper reaches of a tributary (Appendix C.18), this type comprised 0.27 ha (0.67 acres) with one occurrence.

Scattered throughout the plains region are two small and unique types of wetland cover types; these are the Vernal Pools (VP) and Wet Meadow/ Grassland (WM/GL). The VP cover type is an ephemeral wetland system that is obvious in the landscape in the spring before leaf-out. This cover type comprises 0.04 percent of the wetland area and at a frequency of 1.3 percent. This cover type included both managed grasslands and wet meadows. Included here are the mesic phase of the remnant prairies. This cover type comprised 1.34 percent of the wetland acreage at a frequency of 6.7 percent. The Vernal Pools (VP) and Wet Meadow/Grassland (WM/GL) cover types, which are small in size, provide habitat for both unique plants and animals.

Numerous fragmented wetlands resulting from human disturbance occur in the study area. These fragmentations resulted from ditching, diking, gravel pits, or compaction of the soil surface. These wetlands are a good indication of the amount of human activity that has occurred in the plains region of the study area. This cover type comprises 0.56 percent of the wetland acreage at a frequency of 3.1 percent.

The wetlands in the study area have a similar degree of hydrophytic vegetation as expressed by the wetness indicator index (Figure 4). The cover types with the highest wetness index were located in the Ohio River flood plain. These cover types were the Flood Plain-Tupelo (FP-T) and Swamp (SW), with ratings of 1.666 and 1.833. The forested cover types of Flood Plain-Oak (FP-O) and Flood Plain-Maple (FP-M) were wetter than equivalent forested wetlands located in the plains region. These cover types had ratings of 2.308 and 2.167 while their equivalents, Plain Forest-Oak (PF-O) and Plain Forest-Maple (PF-M), had higher ratings of 2.538 and 2.864. Except for the few aquatic cover types, the wetness indexes of the forested wetlands found at the PGDP study area were dominated by FAC to FACW species.

Cole's coefficient of interspecific association between cover types and soil series indicated that some cover types were more positively associated with certain soil series (Figure 7). The cover types with the highest positive association with a soil series were Vernal Pools (VP), Plain Forest-Cottonwood (PF-C), and Flood Plain-Tupelo (FP-T). These cover types were limited in occurrence and distribution in the study site and therefore more closely associated with certain soil series. The cover types that are more abundant and have a more positive association with certain soil series are Flood Plain-Birch (FP-B), Plain Forest-Oak (PF-O), and Wet Meadow/Grassland (WM/GL). The Flood Plain-Birch (FP-B) is associated the hydrologic and chemical conditions characterized by flood plain terraces. The Plain Forest-Oak (PF-O) is located on the plains region where the Henry series is the largest soil type (Table 2).

This frequently occurring cover type is commonly associated with the abundantly occurring Henry soil series in the plains region of the study site. Wet meadows and remnant prairie grasslands of the Wet Meadow/Grassland type are positively associated with the Henry soil series in the plains region. The remaining cover types showed a weaker association with specific soil series.

Observations and study conclusions from this wetland delineation are summarized below.

a. A total of 1,083 separate wetlands were located and mapped within the study area.

b. A total of 639.94 ha (1,581.28 acres) of wetlands were mapped in the study area. This represented a 31 percent increase in wetlands over the NWI maps.

c. The largest contiguous wetland area is located in the Ohio River flood plain.

d. Forested wetlands comprise 63 percent of the wetland cover types.

e. The largest wetland cover type by mean area is the Flood Plain-Cottonwood (FP-C).

f. The most frequently occurring wetland cover type is Agricultural (AG).

g. Wetlands delineated in this study comprise 13.64 percent of the study area.

h. The difference between the 80 percent occurrence of hydric soils and the 13.64 percent of wetlands that currently occur at PGDP represents a possible 66.36 percent loss of wetlands within the area since the 1780's. This comparison represents the worst case scenario.

i. The largest non-agricultural wetland cover type is the Plain Forest-Oak (PF-O).

j. Numerous small-sized wetlands are included in the Vernal Pools (VP) and Wet Meadow/Grassland cover types. These types have a high value for plant and animal diversity and are scattered throughout the study area.

k. Cover types located in the Ohio River flood plain have species with wetter indicator statuses.

l. The cover types with the strongest positive index of association with certain soil series are those with the smallest occurrence and distribution within the study site. Of the group of more commonly occurring cover types, the Wet Meadow/Grassland (WM/GL) type is strongly

associated with the Henry soil series. This cover type contains remnants of natural occurring prairies.

m. Two mature second growth forests were located within PGDP, one wetland and one upland forest.

n. The wetlands identified and delineated are shown on the wetland baseline map (Appendix D).

The results of this report can be used for many applications. These include: 1) planning construction activities that are going to discharge fill material, 2) wetland mitigation or restoration efforts, 3) assessing gains or losses of wetland trends, 4) evaluating impacts to wetlands, and 5) managing wetland resources. Each of these will be briefly explained. The need to request a wetland delineation to be performed to decide whether wetlands occur at future construction sites is not necessary based on the mapping results. It will be necessary to determine the jurisdictional boundary for the actual impact area to be filled.

The results of this study will also be useful in monitoring wetlands or selecting mitigation sites. Using the results from Cole's association, soil units for areas selected as mitigation sites can be cross referenced to Table 9 to decide which cover type has the greatest affinity for this unit. This will help with design criteria and planting schedules. The long term trends of gains or losses of wetlands can now be decided if needed for NEPA documentation. The impacts to wetlands can be evaluated using different wetland evaluation models. Many of the results and baseline information presented in this report are used in these types of evaluations. And, the short and long range management plans for wetlands can be developed now that the baseline status and characterization have been completed.

6 Wetland Functions

Wetland functions are the physical, chemical, and biological processes or attributes of wetlands that are vital to the integrity of the wetland system, and operate whether or not they are viewed as vital to society (Adamus et al. 1991).

The following is a brief description of some wetland functions "as denoted by Adamus et al. (1991) and also includes. . ." the wetland types associated with each function.

a. *Ground Water Recharge and Discharge* - Ground water recharge is the movement (usually downward) of surface water, whereas ground water discharge is the movement (usually laterally or upward) of ground water into the surface (springs). Shallow recharge and minor ground water discharges are sometimes termed leakage or seepage. When discharge to streams occurs during dry seasons, it is termed low (or base) flow augmentation. Wetland types associated with this function are Flood Plain-Birch, Flood Plain-Cottonwood, Flood Plain-Maple, Flood Plain-Oak, Flood Plain-Tupelo, Swamp, Plain Forest-Birch, Plain Forest-Cottonwood, Plain Forest-Farmed, Plain Forest-Maple, Plain Forest-Oak, Vernal Pool, Wet Meadow/Grassland, Open Water, and Man Made.

b. *Floodflow Alteration* - Floodflow alteration is the process by which peak flows from run-off, surface flow, ground water interflow and discharge, and precipitation enter a wetland and are stored or delayed in their down slope journey. Floodflow alteration also includes floodflow desynchronization, which is the process by which flood waters are stored in numerous wetlands within a watershed, and then gradually released in a staggering manner. This gradual release usually results in more persistent flow peaks downstream. Wetland types associated with this function are Swamp, Wet Meadow/Grassland, Open Water, Agricultural, and Man Made.

c. *Sediment Stabilization* - Sediment stabilization consists both of shoreline stabilization and dissipation of erosive forces. Shoreline stabilization is the stabilization of soil at the water's edge or in shallow water by roots and other plant parts. Dissipation of erosive forces is

the lessening of energy associated with waves, currents, ice, water-level fluctuations, or ground water flow. Wetland types associated with this function are Open Water and Swamp.

d. *Sediment/Toxicant Retention* - Sediment/toxicant retention is the process by which suspended solids and chemical contaminants such as pesticides and heavy metals adsorbed to them are retained and deposited within a wetland. Deposition of sediments can ultimately lead to removal of toxicants through burial, chemical breakdown, or temporary assimilation into plant tissues. Wetland type associated with this function is Swamp.

e. *Nutrient Removal/Transformation* - Nutrient removal/transformation includes the storage of nutrients within the sediment or plant substrate; the transformation of inorganic nutrients to their organic forms; and the transformation and subsequent removal of one nutrient (nitrogen) as a gas. Nutrient removal/transformation involves trapping of nutrients before they reach deep water, are carried downstream, or are transported to underlying aquifers. Wetland types associated with this function are Flood Plain-Birch, Flood Plain-Cottonwood, Flood Plain-Maple, Flood Plain-Oak, Flood Plain-Tupelo, Swamp, Plain Forest-Birch, Plain Forest-Cottonwood, Plain Forest-Farmed, Plain Forest-Maple, and Plain Forest-Oak.

f. *Production Export* - Production export refers to the flushing of relatively large amounts of organic material from the wetland to downstream or adjacent deeper waters. Wetland types associated with this function are Flood Plain-Birch, Flood Plain-Cottonwood, Flood Plain-Maple, Flood Plain-Oak, Flood Plain-Tupelo, Swamp, Plain Forest-Birch, Plain Forest-Cottonwood, Plain Forest-Farmed, Plain Forest-Maple, and Plain Forest-Oak.

g. *Aquatic Diversity/Abundance* - Aquatic diversity/abundance is the support of a notably great on-site diversity and/or abundance of fish or invertebrates that are mainly confined to the water and saturated soils. Wetland types associated with this function are Swamp, Vernal Pool, Open Water, and Man Made.

h. *Wildlife Diversity/Abundance* - Wildlife diversity/abundance is the support of a notably great on-site diversity and/or abundance of wetland-dependent birds. Wetland types associated with this function are Flood Plain-Birch, Flood Plain-Cottonwood, Flood Plain-Maple, Flood Plain-Oak, Flood Plain-Tupelo, Swamp, Plain Forest-Birch, Plain Forest-Cottonwood, Plain Forest-Farmed, Plain Forest-Maple, Plain Forest-Oak, Vernal Pool, Open Water, and Man Made.

i. *Recreation* - Recreation includes both consumptive (e.g. sport fishing, food gathering, hunting) and nonconsumptive (e.g. swimming, canoeing, kayaking, birding) forms of recreation that are water

dependent and occur in either an incidental or obligatory manner in wetlands. Wetland types associated with this function are Open Water and Man Made.

j. *Uniqueness/Heritage* - Uniqueness/heritage includes use of wetlands for aesthetic enjoyment, nature study, education, scientific research, open space, preservation of rare or endemic species, protection of archaeologically or geologically unique features, maintenance of historic sites, and an infinite number of other mostly intangible uses. Wetland type associated with this function is Vernal Pool.

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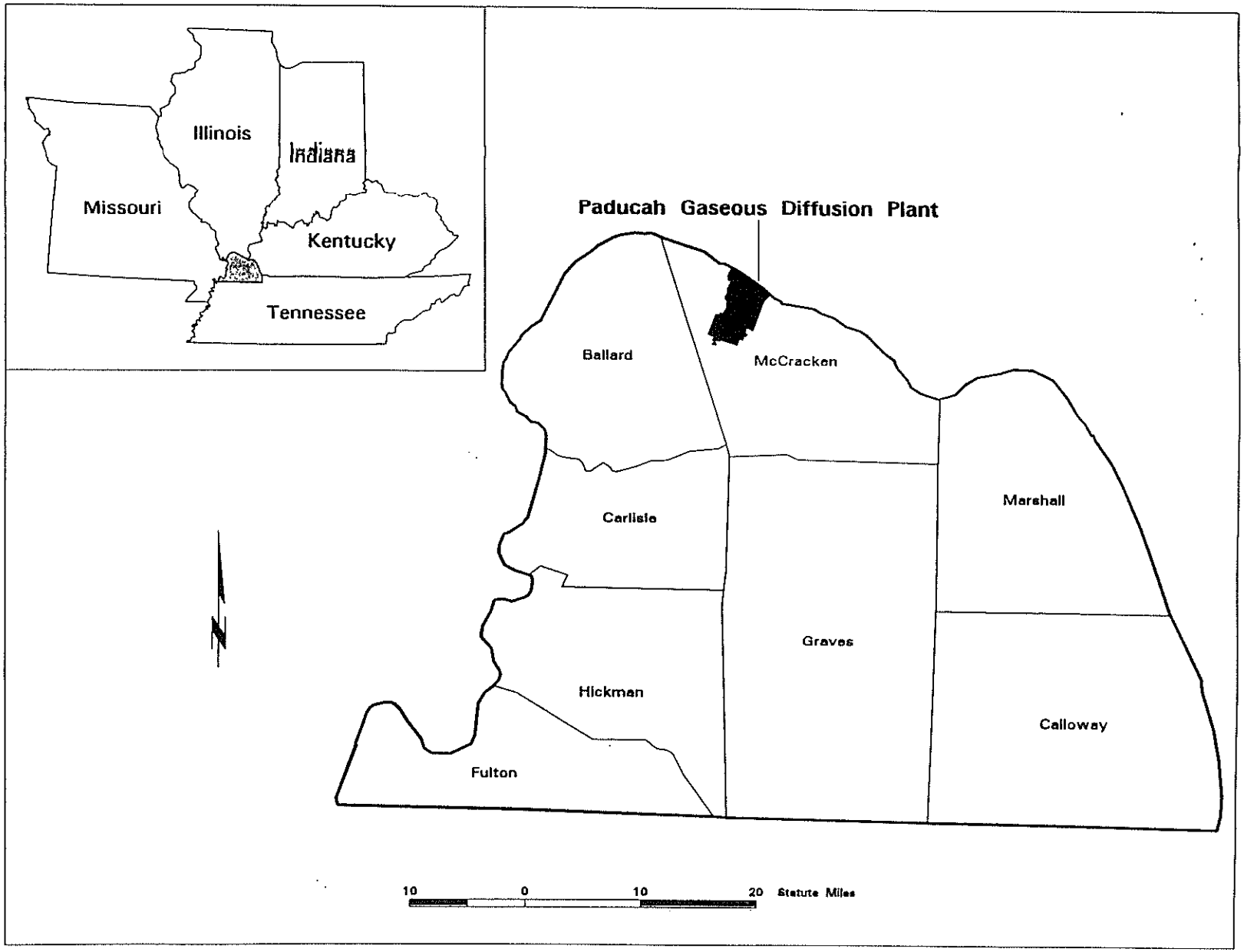


Figure 1. The Jackson Purchase of Kentucky showing the location of the Paducah Gaseous Diffusion Plant

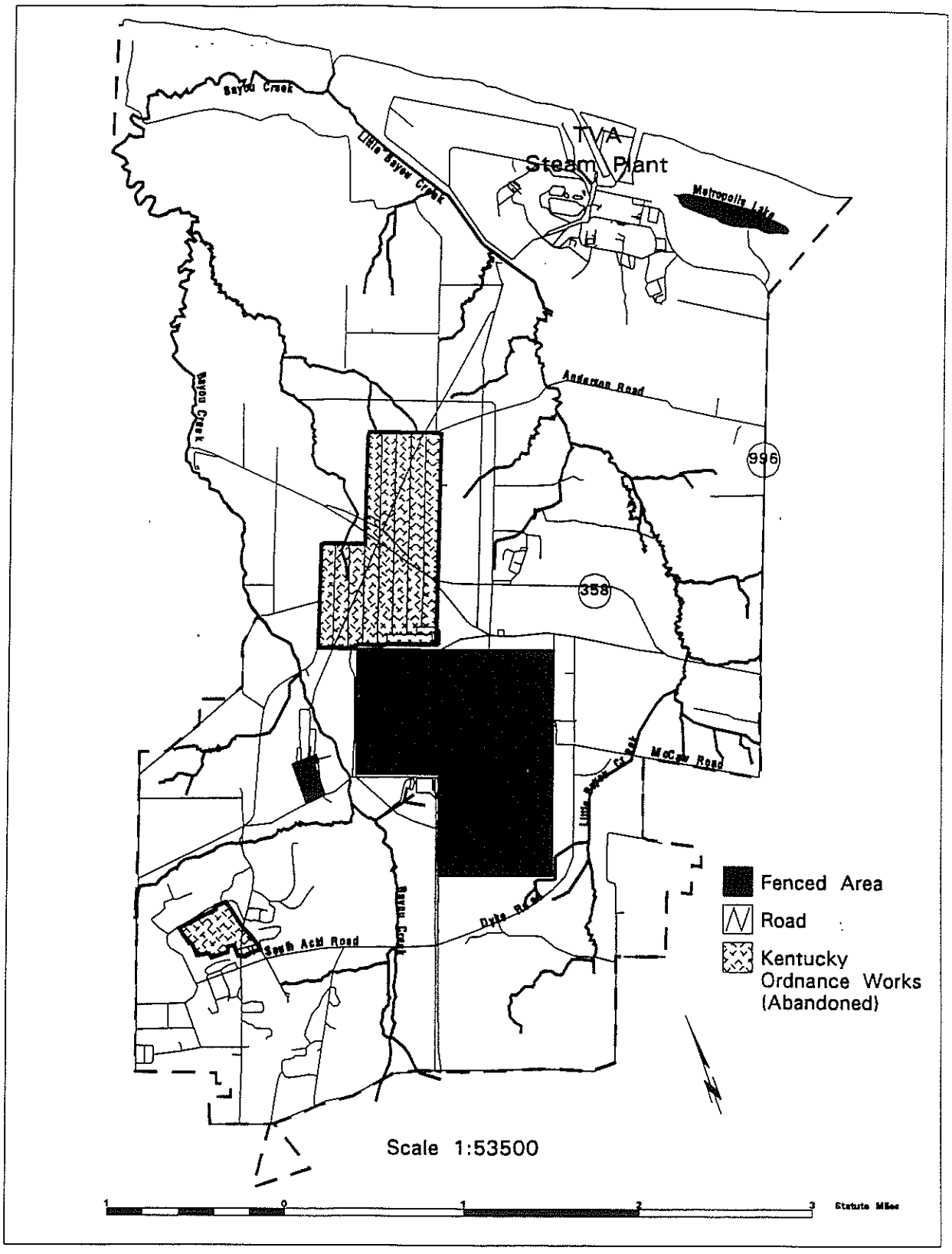


Figure 2. Limits of wetland investigation at the Paducah Gaseous Diffusion Plant

FIGURE 3. MEAN-AREA SIZE OF WETLANDS

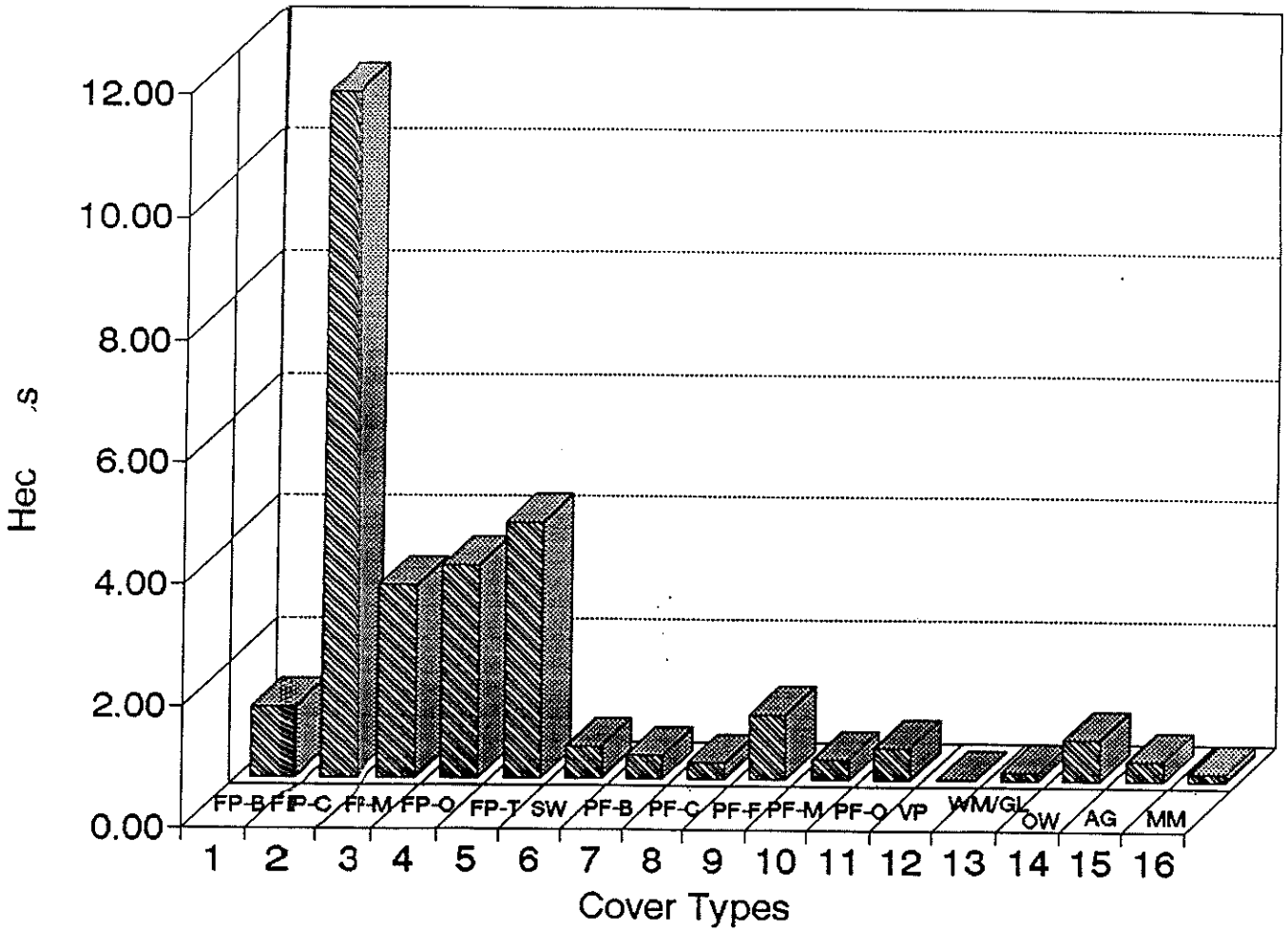


FIGURE 4. WETNESS INDICATOR INDEX

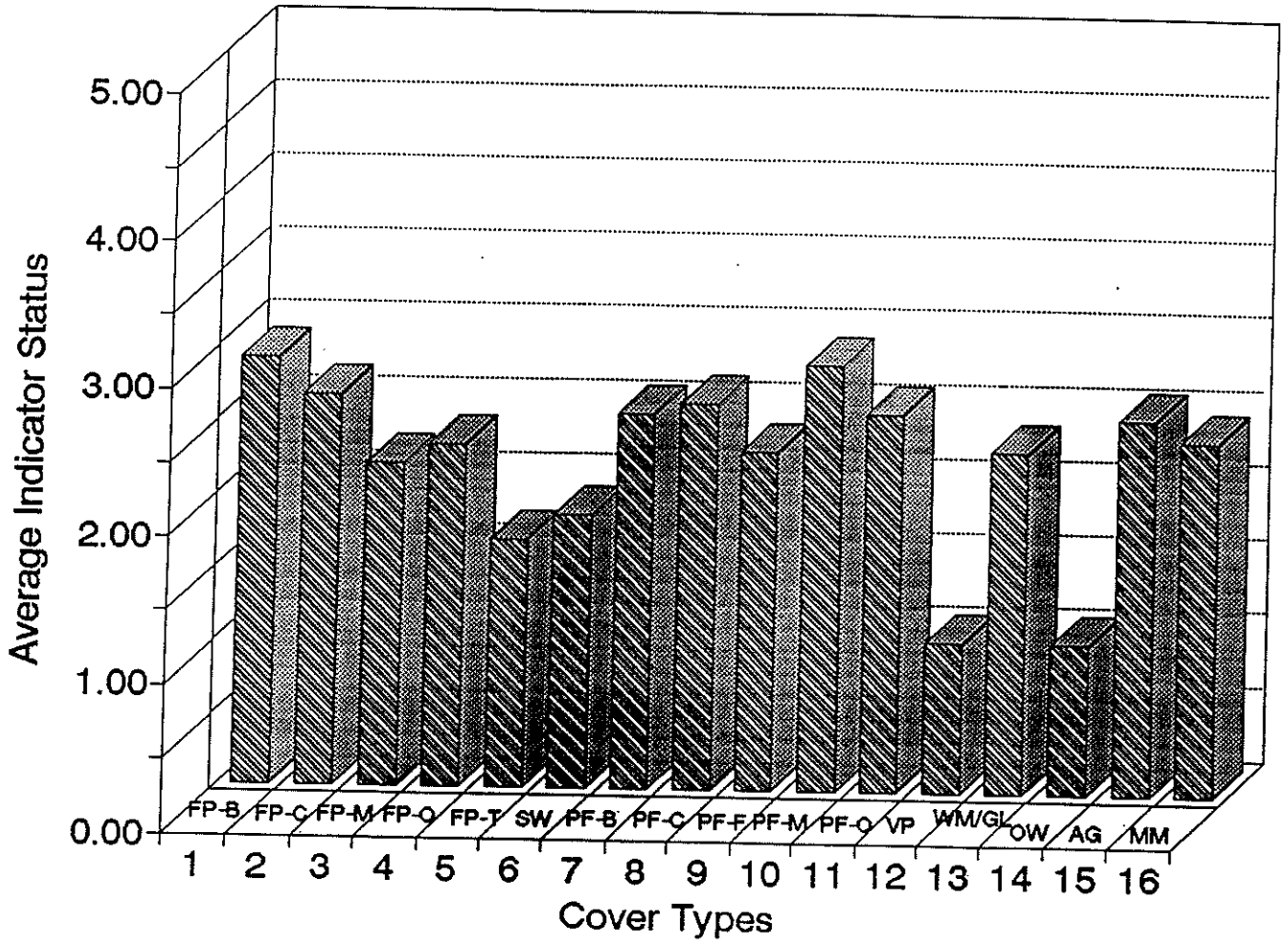


FIGURE 5. TOTAL WETLAND PERCENTAGE AREA

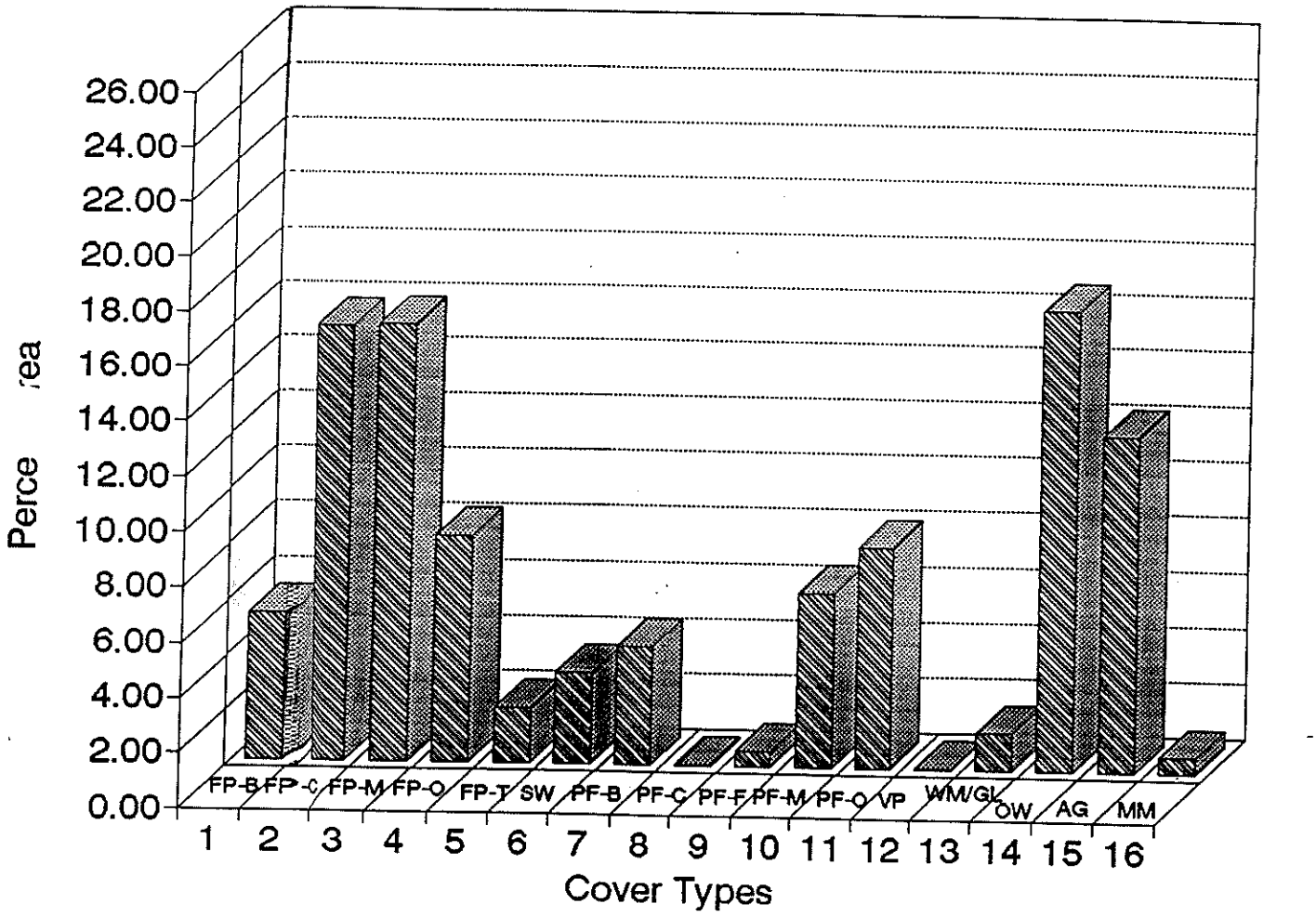


FIG 6. TOTAL WETLANDS PERCENT FREQUENCY

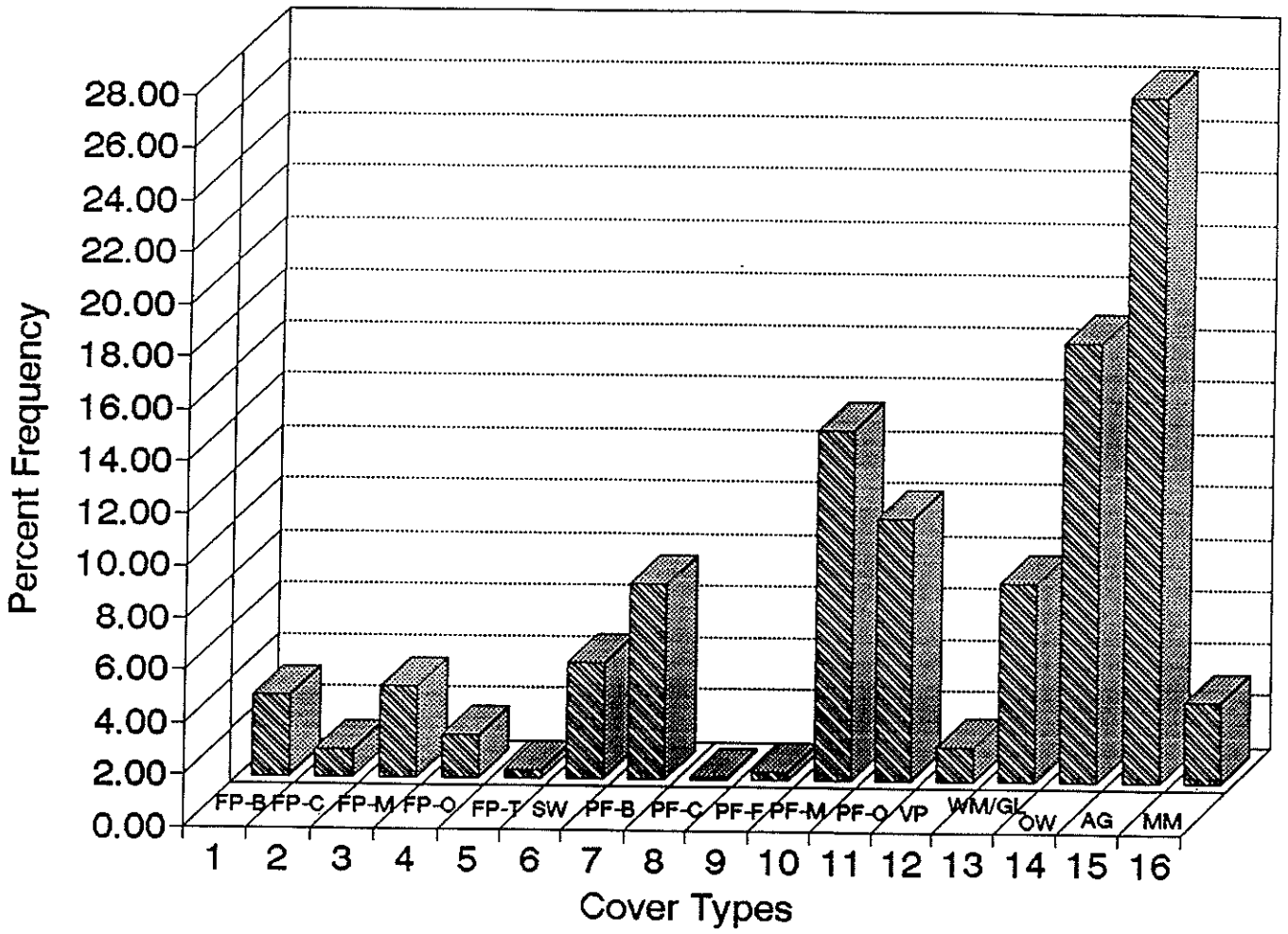


FIG 7. COEFFICIENT OF INTERSPECIFIC ASSOCIATION

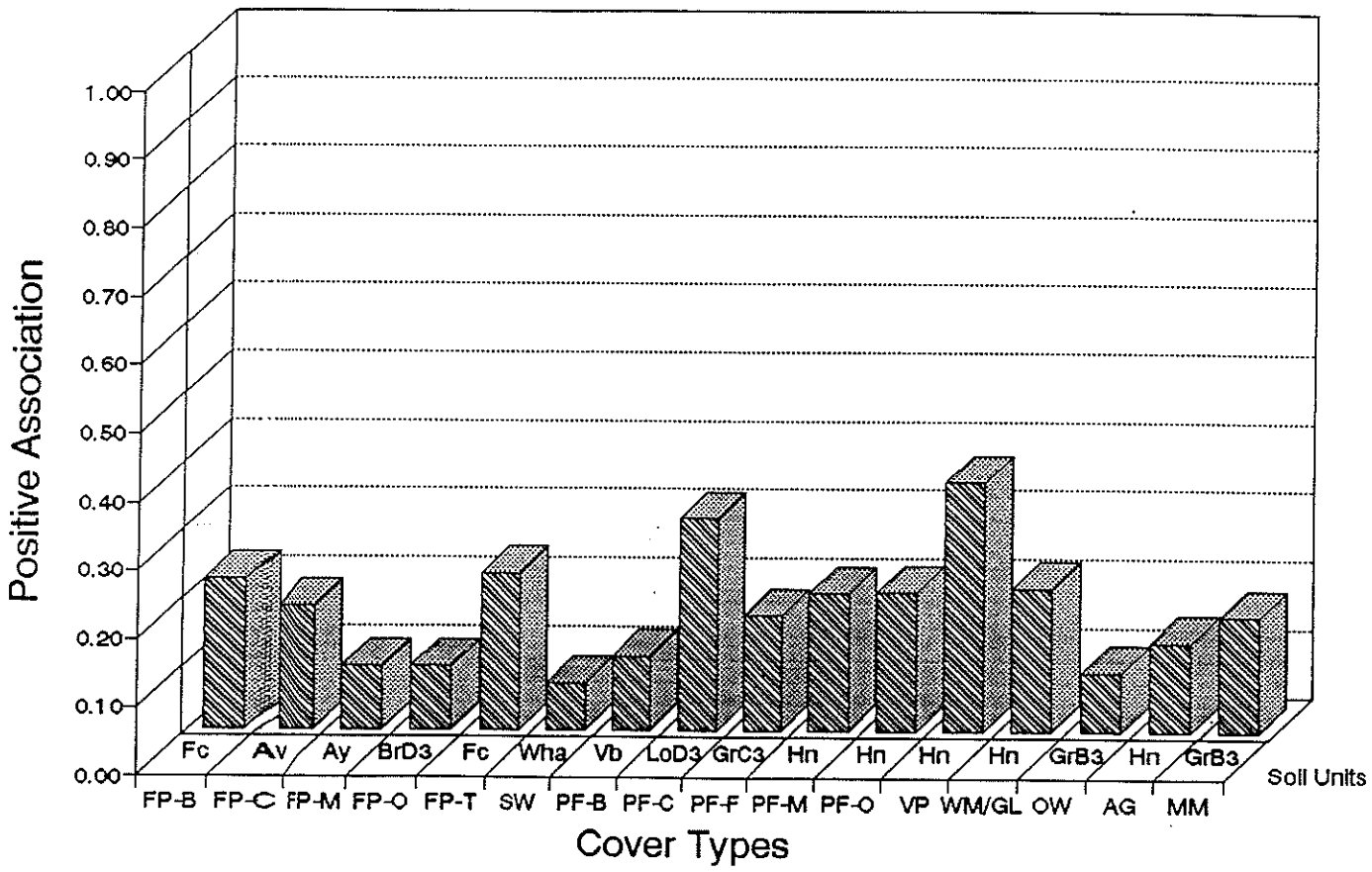


Table 1
National Wetlands Inventory (NWI) Areas and Frequency
Cowardin (1979) Classes

Abbreviation	Cowardin Classification	Hectares[1]	Frequency
L1UBHH	Lacustrine, Limnetic, Unconsolidated bottom, Permanently flooded, Diked/ Impounded	27.50	10
L1UBHX	Lacustrine, Limnetic, Unconsolidated bottom, Permanently flooded, Excavated	65.18	1
L2USCX	Lacustrine, Littoral, Unconsolidated shore, Seasonally flooded, Excavated	42.66	1
PAB3H	Palustrine, Aquatic bed, Rooted vascular, Permanently flooded	2.79	2
PFO1A	Palustrine, Forested, Broad-leaved deciduous, Temporarily flooded	265.73	23
PFO1C	Palustrine, Forested, Broad-leaved deciduous, Seasonally flooded	51.39	5
PFO1CH	Palustrine, Forested, Broad-leaved deciduous, Seasonally flooded, Diked/ Impounded	43.37	3
PFO1F	Palustrine, Forested, Broad-leaved deciduous, Semipermanently flooded	4.84	1
PSS1A	Palustrine, Scrub-shrub, Broad-leaved deciduous, Temporally flooded	0.04	1
PSS1F	Palustrine, Scrub-shrub, Broad-leaved deciduous, Semipermanently flooded	21.68	3
PSS6F	Palustrine, Scrub-shrub, Deciduous, Semipermanently flooded	4.15	1
PUBF	Palustrine, Unconsolidated bottom, Semipermanently flooded	4.29	3
PUBFX	Palustrine, Unconsolidated bottom, Semipermanently flooded, Excavated	1.66	1
PUBGH	Palustrine, Unconsolidated bottom, Unknown, Diked/Impounded	5.67	1
PUBH	Palustrine, Unconsolidated bottom, Diked/ Impounded	3.84	9
PUBHH	Palustrine, Unconsolidated bottom, Permanently flooded, Diked/Impounded	13.25	17
PUBHX	Palustrine, Unconsolidated bottom, Permanently flooded, Excavated	20.76	40
PUSCX	Palustrine, Unconsolidated shore, Seasonally flooded, Excavated	4.31	1
TOTALS		583.10	123

[1] English conversion: 1 hectare = 2.471 acres

Table 2
Mapped Soil Units Acreages and Frequencies

Unit	Map Unit Name	Hectares[1]	Freq.
Av	Alluvial land, steep	37.52	9
Ay[2]	Arkabutla silt loam	85.27	4
BrD3[2]	Brandon silty clay loam, 10-30% slopes	59.90	2
Bu	Bruno loamy fine sand	15.32	3
CaA[2]	Calloway silt loam, 0-2% slopes	669.63	70
CaB[2]	Calloway silt loam, 2-6% slopes	424.69	57
ChA	Chavies fine sandy loam, 0-4% slopes	30.02	1
Db	Dubbs silty clay loam, clayey subsoil variant	18.10	2
Du	Dundee silty clay loam, clayey subsoil variant	52.74	3
Fc[2]	Falaya-Collins silt loams	324.75	9
GrA	Grenada silt loam, 0-2% slopes	25.61	9
GrB	Grenada silt loam, 2-6% slopes	74.96	23
GrB3[2]	Grenada silt loam, 2-6% slopes, severely eroded	515.38	40
GrC3[2]	Grenada silt loam, 6-12% slopes, severely eroded	214.17	22
Hn[2]	Henry silt loam	832.97	11
LoB[2]	Loring silt loam, 2-6% slopes	131.20	1
LoC3	Loring silt loam, 6-12%, severely eroded	44.19	2
LoD[2]	Loring silt loam, 12-20% slopes	33.85	3
LoD3	Loring silt loam, 12-20%, severely eroded	179.66	7
MmB	Memphis silt loam, 2-6% slopes	3.76	1
MpC3	Memphis silty clay loam, 6-12%, severely eroded	1.86	1
Nd	Newark-Lindside silty clay loams	34.21	1
No	Nolin silty clay loam	8.77	1
Nr[2]	Nolin-Robinsonville silt loams	41.32	4
Ro	Rosebloom silt loam	21.60	2
Sw[2]	Swamp	69.67	1
Vb[2]	Vicksburg silt loam	212.75	6
Wa[2]	Waverly silt loam	9.60	2
WhA	Wheeling silt loam, 0-2% slopes	102.71	8
WhB	Wheeling silt loam, 2-6% slopes	6.28	2
g-pit	Gravel pit	11.72	2
water	Water	146.09	17
TOTAL		4,440.29	326

[1] English conversion: 1 hectare = 2.471 acres
[2] Hydric and non-hydric with hydric inclusions

Table 3
Representative Sample Point Numbers by Cover Type

Cover Type	Cover Type #[1]	Sample Point Number
Flood Plain-Birch (FP-B)	2	36, 46, 50, 56
Flood Plain-Cottonwood (FP-C)	3	58
Flood Plain-Maple (FP-M)	4	60, 67, 24
Flood Plain-Oak (FP-O)	5	57, 59, 19
Flood Plain-Tupelo (FP-T)	6	63
Swamp (SW)	15	22, 30, 61, 62, 65
Plain Forest-Birch (PF-B)	9	9, 11, 21, 27, 51
Plain Forest-Cottonwood (PF-C)	10	12
Plain Forest-Farmed (PF-F)	11	23, 28
Plain Forest-Maple (PF-M)	12	1, 8, 10, 18, 31, 32, 37, 38, 44
Plain Forest-Oak (PF-O)	13	14, 26, 29, 34, 35, 45, 47, 48, 49
Vernal Pool (VP)	17	6, 40
Wet Meadow/Grassland (WM/GL)	18	17, 64, 33
Open Water (OW)	8	7, 16
Agricultural (AG)	1	2, 3, 5, 41, 42, 43, 66
Man Made (MM)	7	13, 15, 25, 39

[1] These numbers correspond with cover type numbers listed on the appropriate maps.

Table 4
Mean Area (Hectares[1]) for Cover Types

Cover Type	Frequency	Mean-Area	Min/Max-Area
Flood Plain-Birch (FP-B)	29	1.17	0.04/12.18
Flood Plain-Cottonwood (FP-C)	9	11.21	0.45/38.79
Flood Plain-Maple (FP-M)	32	3.17	0.04/43.41
Flood Plain-Oak (FP-O)	15	3.48	0.09/14.67
Flood Plain-Tupelo (FP-T)	3	4.20	1.13/ 9.80
Swamp (SW)	41	0.52	0.004/7.05
Plain Forest-Birch (PF-B)	71	0.38	0.01/ 4.67
Plain Forest-Cottonwood (PF-C)	1	0.27	0.27/ 0.27
Plain Forest-Farmed (PF-F)	3	1.08	0.13/ 2.51
Plain Forest-Maple (PF-M)	126	0.32	0.01/ 4.98
Plain Forest-Oak (PF-O)	94	0.54	0.004/5.31
Vernal Pool (VP)	12	0.02	0.01/ 0.04
Wet Meadow/Grassland (WM/GL)	72	0.12	0.005/1.58
Open Water (OW)	158	0.68	0.002/23.23
Agricultural (AG)	247	0.31	0.004/14.07
Man Made (MM)	29	0.13	0.009/1.27
River	1	339.22	339.2/339.2

[1] English conversion: 1 hectare = 2.471 acres

Table 5
Linear Wetland Features

Classification	Length	Frequency
PFO1A[1]	3,107.07 m	7
R2UBH[1]	8,996.84 m	8
Stream[2]	65,186.18 m	539

[1] Cowardin (1979) classification
[2] Streams as labeled on wetlands map

Table 6
Percent Area of Wetland Cover Types

Cover Type	Hectares[1]	Percent
Flood Plain-Birch (FP-B)	33.96	5.31
Flood Plain-Cottonwood (FP-C)	100.71	15.74
Flood Plain-Maple (FP-M)	101.25	15.82
Flood Plain-Oak (FP-O)	52.13	8.15
Flood Plain-Tupelo (FP-T)	12.59	1.97
Swamp (SW)	21.12	3.30
Plain Forest-Birch (PF-B)	27.11	4.24
Plain Forest-Cottonwood (PF-C)	0.27	0.04
Plain Forest-Farmed (PF-F)	3.25	0.51
Plain Forest-Maple (PF-M)	40.27	6.29
Plain Forest-Oak (PF-O)	50.97	7.96
Vernal Pool (VP)	0.23	0.04
Wet Meadow/Grassland (WM/GL)	8.58	1.34
Open Water (OW)	106.67	16.67
Agricultural (AG)	77.22	12.07
Man Made (MM)	3.61	0.56
Totals	639.94	100.00

[1] English conversion: 1 hectare = 2.471 acres

Table 7
Percent Frequency of Wetland Cover Types

Cover Type	Frequency	Relative Frequency
Flood Plain-Birch (FP-B)	29	3.1
Flood Plain-Cottonwood (FP-C)	9	1.0
Flood Plain-Maple (FP-M)	32	3.4
Flood Plain-Oak (FP-O)	15	1.6
Flood Plain-Tupelo (FP-T)	3	0.3
Swamp (SW)	41	4.4
Plain Forest-Birch (PF-B)	71	7.5
Plain Forest-Cottonwood (PF-C)	1	0.1
Plain Forest-Farmed (PF-F)	3	0.3
Plain Forest-Maple (PF-M)	126	13.4
Plain Forest-Oak (PF-O)	94	10.0
Vernal Pool (VP)	12	1.3
Wet Meadow/Grassland (WM/GL)	72	7.6
Open Water (OW)	158	16.8
Agricultural (AG)	247	26.2
Man Made (MM)	29	3.1

Table 8
Mapped Soil Units Located at Representative Sample Points

Unit	Map Unit Name	Sample Point #
Ay	Arkabutla silt loam	59
BrD3	Brandon silty clay loam, 10-30% slopes	56, 67
CaA	Calloway silt loam, 0-2% slopes	13, 20, 38, 43, 7
CaB	Calloway silt loam, 2-6% slopes	17, 31, 4, 33
Db	Dubbs silty clay loam, clayey subsoil variant	58
Du	Dundee silty clay loam, clayey subsoil variant	65
Fc	Falaya-Collins silt loams	36, 39, 40, 41, 46, 50,
GrB3	Grenada silt loam, 2-6% slopes, severely eroded	9, 14, 23
GrC3	Grenada silt loam, 6-12% slopes, severely eroded	36
Hn	Henry silt loam	1, 2, 3, 5, 6, 8, 19, 25,
LoB	Loring silt loam, 2-6% slopes	49
LoD	Loring silt loam, 12-20% slopes	12
Sw	Swamp	61
Vb	Vicksburg silt loam	10, 11, 18, 21, 22, 27,
WhA	Wheeling silt loam, 0-2% slopes	60, 62
g-pit	Gravel pit	15, 16

Table 9. Coefficient of Interspecific Association

		AG	FP-B	FP-C	FP-M	FP-O	FP-T	MM	OW	Cover Type PF-B	PF-C	PF-F	PF-M	PF-O	RIVER	SW	VP	WM/GL
	Av	−1.000±0.30	−1.000±0.73	0.181±0.021	0.026±0.010	−0.431±0.73	−1.000±2.05	−1.000±0.94	0.006±0.008	−1.000±0.56	−1.000±3.74	−1.000±2.16	−1.000±0.43	−1.000±0.54	0.318±0.029	0.032±0.018	−1.000±1.73	−1.000±0.64
	Ay	−0.732±0.32	−1.000±0.78	0.040±0.020	0.094±0.009	0.033±0.016	−1.000±2.18	−1.000±1.00	−0.825±0.38	−1.000±0.60	−1.000±4.00	−1.000±2.30	−1.000±0.46	−1.000±0.58	0.055±0.028	0.007±0.017	−1.000±1.84	−1.000±0.69
	BrD3	−0.008±0.39	0.013±0.013	−1.000±1.18	0.011±0.008	0.093±0.013	−1.000±2.66	0.008±0.017	−1.000±0.46	−1.000±0.73	−1.000±4.88	−1.000±2.81	−1.000±0.56	−0.445±0.71	−1.000±1.61	−1.000±0.97	−1.000±2.25	0.007±0.012
	Bu	−1.000±0.62	−1.000±1.51	0.055±0.010	−1.000±0.88	−1.000±1.50	−1.000±4.23	−1.000±1.95	−0.351±0.73	−1.000±1.17	−1.000±7.75	−1.000±4.46	−1.000±0.89	−1.000±1.13	0.218±0.014	−1.000±1.54	−1.000±3.57	−1.000±1.34
	CoA	0.046±0.016	−0.511±0.32	−1.000±0.39	−0.508±0.18	0.055±0.039	−1.000±0.90	−0.003±0.41	0.006±0.019	0.024±0.030	−1.000±1.64	−1.000±0.95	0.044±0.023	−0.020±0.24	−1.000±0.54	0.001±0.040	0.038±0.093	−0.131±0.28
	CoB	−0.066±0.13	0.005±0.038	−1.000±0.41	−0.333±0.19	−0.486±0.33	−1.000±0.93	0.055±0.049	0.005±0.019	−0.444±0.25	−1.000±1.70	−1.000±0.98	0.101±0.022	0.047±0.028	−1.000±0.56	−0.598±0.33	−1.000±0.78	0.120±0.034
	ChA	0.003±0.003	−1.000±1.51	−1.000±1.87	0.019±0.005	−1.000±1.50	0.095±0.023	−1.000±1.95	−0.351±0.73	−1.000±1.17	−1.000±7.75	−1.000±4.46	−1.000±0.89	−1.000±1.13	−1.000±2.56	−1.000±1.54	−1.000±3.57	−1.000±1.34
	Db	−1.000±1.14	−1.000±2.77	0.018±0.006	0.008±0.003	−1.000±2.76	−1.000±7.75	−1.000±3.57	−1.000±1.35	−1.000±2.14	−1.000±14.1	−1.000±8.17	−1.000±1.63	−1.000±2.06	−1.000±4.69	−1.000±2.81	−1.000±6.54	−1.000±2.45
	Du	−1.000±0.43	−1.000±1.04	0.130±0.015	−0.156±0.60	0.002±0.012	−1.000±2.91	−1.000±1.34	0.017±0.006	−1.000±0.80	−1.000±5.33	−1.000±3.07	−1.000±0.61	−1.000±0.77	0.026±0.021	0.016±0.012	−1.000±2.46	−1.000±0.92
	Fa	0.033±0.015	0.221±0.036	−1.000±0.43	0.053±0.021	0.042±0.036	0.228±0.101	0.041±0.047	−0.539±0.17	−0.214±0.27	−1.000±1.80	0.142±0.107	−0.149±0.20	−0.836±0.26	−1.000±0.59	−0.706±0.35	0.055±0.085	−0.548±0.31
	GrA	−1.000±1.40	−1.000±3.40	−1.000±4.20	−1.000±1.98	−1.000±3.38	0.099±0.010	−1.000±4.38	−1.000±1.65	−1.000±2.62	−1.000±17.3	−1.000±10.0	−1.000±1.99	0.007±0.003	−1.000±5.75	−1.000±3.45	−1.000±8.01	−1.000±3.00
	GrB	−0.008±0.39	0.054±0.013	0.006±0.016	−0.291±0.55	−0.044±0.95	−1.000±2.66	−1.000±1.23	0.008±0.006	0.011±0.010	−1.000±4.88	−1.000±2.81	−0.640±0.56	−0.445±0.71	−1.000±1.61	−1.000±0.97	−1.000±2.25	−1.000±0.84
	GrB3	−0.364±0.15	−0.534±0.36	−1.000±0.45	−0.489±0.21	−0.234±0.36	−1.000±1.02	0.168±0.045	0.086±0.017	0.004±0.027	0.271±0.177	0.149±0.102	−0.251±0.21	0.056±0.026	−1.000±0.62	−0.203±0.37	0.062±0.082	−0.020±0.32
	GrC3	−0.297±0.17	0.001±0.030	−1.000±0.52	−0.114±0.24	0.042±0.030	0.036±0.084	0.046±0.039	0.013±0.015	0.103±0.025	0.286±0.153	0.167±0.088	−0.026±0.24	−0.307±0.31	−1.000±0.71	−0.378±0.43	−1.000±1.00	−0.363±0.37
Soil	Hn	0.131±0.024	−0.689±0.21	−1.000±0.26	−0.863±0.12	−0.939±0.21	−1.000±0.60	−0.493±0.27	−0.350±0.10	0.027±0.045	−1.000±1.10	−0.481±0.63	0.200±0.035	0.203±0.044	−1.000±0.36	0.059±0.060	0.364±0.139	0.210±0.052
	LoB	0.041±0.007	0.018±0.017	−1.000±0.91	−1.000±0.43	−1.000±0.73	−1.000±2.07	−0.037±0.95	−1.000±0.36	0.002±0.013	−1.000±3.79	−1.000±2.18	−0.781±0.43	0.055±0.013	−1.000±1.25	−1.000±0.75	−1.000±1.75	−1.000±0.65
	LoC3	−1.000±0.70	−1.000±1.70	−1.000±2.09	−1.000±0.98	−1.000±1.68	−1.000±4.74	0.017±0.010	0.003±0.004	0.004±0.006	−1.000±8.67	−1.000±4.99	0.001±0.004	0.003±0.006	−1.000±2.87	0.009±0.008	−1.000±4.00	0.006±0.007
	LoD	−1.000±0.66	0.008±0.008	0.015±0.010	−0.016±0.93	0.021±0.008	−1.000±4.46	−1.000±2.06	0.006±0.004	−1.000±1.23	−1.000±8.17	−1.000±4.71	−1.000±0.94	−1.000±1.19	−1.000±2.70	0.009±0.008	−1.000±3.77	−1.000±1.41
	LoD3	0.016±0.009	0.075±0.021	−1.000±0.74	−0.143±0.35	−0.229±0.59	−1.000±1.67	−0.363±0.77	0.016±0.010	−0.286±0.46	0.310±0.108	−1.000±1.76	−0.565±0.35	0.012±0.016	−1.000±1.01	−1.000±0.61	−1.000±1.41	−1.000±0.53
	Nd	−1.000±1.14	−1.000±2.77	0.038±0.006	−1.000±1.61	−1.000±2.76	−1.000±7.75	−1.000±3.57	−1.000±1.35	−1.000±2.14	−1.000±14.1	−1.000±8.17	−1.000±1.63	−1.000±2.06	0.035±0.008	−1.000±2.81	−1.000±6.54	−1.000±2.45
	No	−1.000±0.75	−1.000±1.81	0.056±0.009	0.001±0.004	−1.000±1.80	−1.000±5.07	−1.000±2.34	0.003±0.003	−1.000±1.40	−1.000±9.27	−1.000±5.34	−1.000±1.06	−1.000±1.35	0.033±0.012	−1.000±1.84	−1.000±4.28	−1.000±1.60
	Nr	−1.000±0.48	−1.000±1.16	0.091±0.014	0.000±0.006	−1.000±1.15	−1.000±3.24	−1.000±1.49	0.005±0.005	−1.000±0.89	−1.000±5.93	−1.000±3.42	−1.000±0.68	−1.000±0.86	0.140±0.019	0.018±0.011	−1.000±2.73	−1.000±1.02
	Ro	−0.173±0.81	−1.000±1.96	0.017±0.008	−1.000±1.14	−1.000±1.95	0.197±0.018	−1.000±2.52	0.004±0.003	−1.000±1.51	−1.000±10.0	−1.000±5.77	−1.000±1.15	−1.000±1.46	−1.000±3.31	−1.000±1.99	−1.000±4.62	−1.000±1.73
	Sw	−1.000±0.33	−1.000±0.81	−1.000±1.01	0.046±0.009	0.048±0.016	−1.000±2.28	−1.000±1.05	−0.809±0.39	−1.000±0.63	−1.000±4.17	−1.000±2.40	−1.000±0.48	−1.000±0.60	−1.000±1.38	0.051±0.016	−1.000±1.92	−1.000±0.72
	Yb	−0.331±0.17	0.040±0.031	−0.712±0.51	0.062±0.018	−0.241±0.41	−1.000±1.15	−0.373±0.53	−0.228±0.20	0.109±0.024	−1.000±2.11	0.164±0.091	−0.287±0.24	−0.890±0.30	−1.000±0.70	0.058±0.031	−1.000±0.97	0.039±0.027
	Wa	0.002±0.004	0.007±0.009	−1.000±1.78	−1.000±0.84	0.047±0.009	−1.000±4.04	−1.000±1.86	−1.000±0.70	−1.000±1.11	−1.000±7.39	−1.000±4.25	−1.000±0.85	0.009±0.007	−1.000±2.44	−1.000±1.46	0.066±0.021	−1.000±1.27
	WhA	−0.901±0.27	−1.000±0.67	0.054±0.023	0.092±0.011	0.026±0.019	0.177±0.053	−1.000±0.86	−0.611±0.32	−1.000±0.51	−1.000±3.42	−1.000±1.97	−1.000±0.39	−1.000±0.50	0.010±0.032	0.070±0.019	−1.000±1.58	−1.000±0.59
	WhB	−1.000±0.88	−1.000±2.15	0.037±0.007	0.007±0.003	−1.000±2.13	−1.000±6.00	−1.000±2.77	0.001±0.003	−1.000±1.65	−1.000±10.9	−1.000±6.32	−1.000±1.26	−1.000±1.60	−1.000±3.63	−1.000±2.18	−1.000±5.06	−1.000±1.90
	g_pit	−1.000±0.53	−1.000±1.28	−1.000±1.58	−1.000±0.74	−1.000±1.27	−1.000±3.57	0.014±0.013	0.039±0.005	−1.000±0.98	−1.000±6.54	−1.000±3.77	−1.000±0.75	−1.000±0.95	−1.000±2.16	−1.000±1.30	−1.000±3.02	−1.000±1.15
	river ba	−1.000±1.99	−1.000±4.81	−1.000±5.94	−1.000±2.80	−1.000±4.78	−1.000±13.4	−1.000±6.20	−1.000±2.34	−1.000±3.70	−1.000±24.5	−1.000±14.1	−1.000±2.82	−1.000±3.58	0.037±0.004	−1.000±4.88	−1.000±11.3	−1.000±4.25
	water	−1.000±0.36	−1.000±0.88	0.106±0.018	−1.000±0.51	−1.000±0.88	−1.000±2.47	−1.000±1.14	0.035±0.007	−1.000±0.68	−1.000±4.52	−1.000±2.61	−1.000±0.52	−1.000±0.66	0.021±0.024	−1.000±0.90	−1.000±2.09	−0.341±0.78

ERROR TERM REFLECTS STANDARD DEVIATION

Appendix A
Vascular Plant Checklist

This vascular plant species checklist is arranged under the major groupings of fern and fern allies, gymnosperms, monocots and dicots. Under each of these groups, the families, genera and species are arranged alphebetically. Common names are provided in the right hand margin for each species. This list was compiled while doing the wetland delineation at the PGDP study area during the spring of 1993. Therefore the list represents species recognizable during that phenological period. No location data was collected for the species reported herein.

Numerous local and regional floras were used to identify plant species in this list. The following botanical treatments were used; *Manual of Vascular Plants of the Northeast and Adjacent Canada* (Gleason and Cronquist, 1991), *Vascular Plants of Kentucky, an Annotated Checklist* (Browne and Athey, 1992), *Aquatic and Wetland Plants of Kentucky* (Beal and Thieret, 1986), *A Guide to The Wildflowers and Ferns of Kentucky* (Wharton and Barbour, 1971), *Woody Vines of the Southeast* (Duncan 1975), *Manual of the Vascular Flora of the Carolinas* (Radford, et. al. 1968), *Guide to the Vascular Flora of Illinois* (Mohlenbrock 1986), *Newcomb's Wildflower Guide* (Newcomb 1977) and *The Woody Plants of Ohio* (Braun 1961).

Pteridophyta

Aspleniaceae	
Onoclea sensibilis	Sensitive Fern
Asplenium platyneuron	Ebony Spleenwort
Dryopteris spinulosa	Spinulose Woodfern
Ophioglossaceae	
Botrychium dissectum	Rattlesnake Fern
B. virginianum	Cut-Leaved Grape Fern
Salviniaceae	
Azolla caroliensis	Mosquito Fern

Gymnospermae

Cupressaceae	
Juniperus virginiana	Red Cedar
Thuja occidentalis	Northern White Cedar
Pinaceae	
Pinus strobus	Eastern White Pine
Taxodiaceae	
Taxodium distichum	Bald Cypress

Angiosperms

Monocotyledonae

Alismaceae	
Alisma plantago-aquatica	Water Plantain
Araceae	
Arisaema dracontium	Jack-in-the-Pulpit
A. triphyllum	Green Dragon
Commelinaceae	
Commelina communis	Common Day Flower
Tradescantia aspera	Spiderwort
T. virginiana	Virginia Spiderwort
Cyperaceae	
Carex crinita	Fringed Sedge
C. granularis	Meadow Sedge
C. hyalinolepis	Shoreline Sedge
C. intumescens	Bladder Sedge
C. laxiculmis	Loosely-Flowered Sedge
C. lurida	Shallow Sedge
C. lupulina	Hop Sedge
C. rosea	Red Sedge
C. scoparia	Pointed Broom Sedge
C. stipata	Stalk-Grain Sedge
C. vulpinoidea	Fox Sedge
Scirpus atrovirens	Green Bulrush
S. cyperinus	Wool-Grass
S. polyphyllus	Leafy Bulrush
S. validus	Soft-Stem Bulrush
Dioscoreceae	
Dioscorea quaternata	Four Leaf Yam
D. villosa	Yellow Yam
Iridaceae	
Iris versicolor	Blueflag
Sisyrinchium angustifolia	Blue-Eyed Grass
Juncaceae	

Juncus bufonius	Toad Rush
J. canadensis	Canada Rush
J. effusus	Soft Rush
J. nodosus	Knotted Rush
J. tenuis	Slender Rush
Lemnaceae	
Lemna minor	Minute Duckweed
Spirodela polyrhiza	Duckweed
Liliaceae	
Allium canadense	Field Garlic
A. vineale	Wild Onion
Asparagus officinale	Asparagus
Erythronium albidum	White Dog-Tooth Violet
Hymenocallus caroliniana	Spider Lily
Ornithogalum umbellatum	Star-of-Bethlehem
Smilacina racemosa	False Solomon's Seal
Smilax herbacea	Smooth Carrion Flower
S. rotundifolia	Common Greenbrier
Trillium recurvatum	Red Trillium
Uvularia grandiflora	Yellow Bellwort
Yucca flaccida	Adam's Needle
Najadaceae	
Potamogeton crispus	Curly Pondweed
P. diversifolia	Water-Thread Pondweed
P. foliosus	Leafy Pondweed
P. nodosus	Long-Leaf Pondweed
Poaceae	
Agrostis gigantea	Red Top Grass
Andropogon virginicus	Broom Sedge
A. gerardii	Big Bluestem
Aristida longespica	Three Awn
Arundinaria gigantea	Giant Cane
Avena sativa	Oats
Bromus inermis	Awnless Bromegrass
B. japonicus	Japanese Chess
B. tectorum	Downy Chess
Chasmanthium latifolium	Sea Oats
Cinna arundinacea	Stout Wood Reed
Cynodon dactylon	Bermuda Grass
Dactylis glomerata	Orchard Grass
Dichanthelium dichotomum	Cypress Witch Grass
Elymus canadensis	Nodding Wild Rye
E. virginicus	Virginia Wild Rye
Festuca aruandinacea	Kentucky Festcue
F. obtusa	Nodding Festcue
F. pratensis	Meadow Festcue
Glyceria arkansas	Manna Grass
G. pallida	Low Manna Grass
G. striata	Fowl Manna Grass

Holcus lanatus	Velvet Grass
Muhlenbergia glabrifloris	Scratch Grass
Panicum dichotomiflorum	Fall Panic Grass
P. virgatum	Switch Grass
Poa annua	Speargrass
P. compressa	Canada Bluegrass
P. pratense	Kentucky Bluegrass
P. sylvestris	Blue Grass
Phleum pratense	Timothy
Schizachyrium scoparium	Little Bluestem
Setaria faberi	Giant Foxtail
S. glauca	Yellow Foxtail
S. viridis	Green Foxtail
Sorghastrum nutans	Indian Grass
Sorghum bicolor	Sorghum
Spartina pectinata	Slough Grass
Sporobolus perfoliata	Clasping Slough Grass
Tripsacum dactyloides	Eastern Gama-Grass
Zea mays	Corn
Typhaceae	
Typha angustifolia	Narrow-Leaved Cattail
T. latifolia	Common Cattail

Dicotyledonae

Acanthaceae	
Ruellia strepens	Smooth Ruellia
Aceraceae	
Acer negundo	Box Elder
A. rubrum	Red Maple
A. saccharinum	Silver Maple
A. saccharum	Sugar Maple
Achillea millefolium	Common Yarrow
Euonymous atropurpurea	Eastern Burning-Bush
Anacardiaceae	
Rhus copallina	Dwarf Sumac
R. radicans	Poison Ivy
Annonaceae	
Asimina triloba	Pawpaw
Apiaceae	
Cicuta maculata	Water Hemlock
Daucus carota	Wild Carrot
Erigenia bulbosa	Harbinger-of-Spring
Eryngium yuccafolium	Rattlesnake Master
Osmorhiza longistylis	Smoother Sweet Cicely
Oxypolis rigidior	Cowbane
Pastinacea sativa	Wild Parsnip

Pastinacea sativa	Wild Parsnip
Sanicula canadensis	Canadian Black Snakeroot
Zizia aurea	Golden Alexander
Apocynaceae	
Amsonia tabernaemontana	Blue Star
Apocynum cannabinum	Indian Hemp
Vinca minor	Common Perriwinkle
Araliaceae	
Aralia spinosa	Hercule's Club
Asclepiadaceae	
Asclepias incarnata	Swamp Milkweed
A. syriaca	Common Milkweed
Asteraceae	
Ambrosia artemisiifolia	Common Ragweed
A. trifida	Giant Ragweed
Antennaria plantaginifolia	Richards Pussytoes
Aster lateriflorus	Side-flowered Aster
A. simplex	Panicled Aster
Bidens cernua	Nodding Bur Marigold
Cacalia atriplicofolia	Pale Indian Plantian
Cirsium altissimum	Tall Thistle
C. arvense	Canada Thistle
C. discolor	Field Thistle
C. vulgare	Bull Thistle
Callicarpa americana	American Beauty-Berry
Centuara maculata	Spotted Knapweed
Conyza canadensis	Horseweed
Coreopsis tripteris	Tall Tickseed
Erigeron annuus	Daisy Fleabane
E. philadelphus	Marsh Fleabane
E. pulchellum	Robin's Plantain
Eupatorium perfoliatum	Common Boneset
E. purpureum	Purple Joe-Pye-Weed
E. rugosum	White Snake
Euthamia graminifolia	Grass-Leaved Goldenrod
Gnaphalium obtusifolium	Catsfoot
Helianthus angustifolia	Narrow-Leaved Sunflower
H. annus	Common Sunflower
H. mollis	Downy Sunflower
Hieracium venosum	Hawkweed
Liatris aspera	Rough Blazing-Star
Rudbeckia hirta	Black-Eyed Susan
R. laciniata	Golden Glow
Senecio glabellus	Grass-Leaf Groundsel
Silphium laciniatum	Compass-Plant
Solidago canadensis	Canada Goldenrod
S. rigida	Rigid Goldenrod
Taraxacum officinale	Common Dandelion
Vernonia gigantea	Tall Ironweed

Balsaminaceae	
Impatiens capensis	Jewel-Weed
Berberidaceae	
Podophyllum peltatum	May Apple
Betulaceae	
Alnus serrulata	Smooth Alder
Betula nigra	River Birch
Bignoniaceae	
Bignonia capreolata	Cross-Vine
Campsis radicans	Trumpet Creeper
Catalpa bignonioides	Southern Catalpa
Bosaceae	
Duchesnea indica	Indian Strawberry
Brassicaceae	
Arabis laevigata	Smooth Rock Cress
Barbarea vulgaris	Yellow Rocket
Brassica rapa	Field Mustard
Capsella bursa-pastoris	Sheperd's purse
Cardamine pensylvanica	Bitter Cress
Draba verna	Whitlow-Grass
Iodanthus pinnatifidus	Purple Rocket
Lepidium virginicum	Poorman's Peppergrass
Caesalpiniaceae	
Cersis canadense	Redbud
Gleditsia aquatica	Water Locust
G. triocanthos	Honey Locust
Campanulaceae	
Lobelia cardinalis	Lobelia
Specularia perfoliata	Sand Sperry
Caprifoliaceae	
Lonicera japonica	Japenese Honeysuckle
L. sempervirens	Trumpet Honeysuckle
Sambucus canadensis	Eared Water-Moss
Symphoricarpus orbiculatus	Coralberry
Viburnum dentatum	Arrow-Wood
V. prunifolium	Black-Haw
Caryophyllaceae	
Cerastium nutans	Nodding Mouse-Eared Chickweed
Chenopodium album	Lamb's Quarters
Silene antirrhina	Sleepy Catchfly
S. virginica	Fire-Pink
Stellaria media	Common Chickweed
Convolvulaceae	
Calystegia sepium	American Bindweed
Ipomoea coccinea	Morning-Glory
Cornaceae	
Cornus amomum	Dogwood

Cornus amomum	Dogwood
C. drummondii	Rough-Leaved Dogwood
C. florida	Flowering Dogwood
Corylaceae	
Carpinus caroliniana	Ironwood
Ostrya virginiana	Hop Hornbean
Crassulaceae	
Penthorum sediodes	Ditch Stone Crop
Cuscutaceae	
Cuscuta cuspidata	Dodder
Ebenaceae	
Halesia carolina	Silverbell Tree
Elaeagnaceae	
Elaegnus angustifolia	Russian Olive
Fabaceae	
Baptisia leucantha	White Wild Indigo
Amorpha fruticosa	False Indigo
Amphicarpaea bracteata	Hog Peanut
Desmodium paniculatum	Panicled Tick Trefoil
Glycine max	Soybean
Lathyrus latifolius	Everlasting Pea
Lespedeza cuneata	Chinese Buch Clover
Medicago lupulina	Black Medic
M. sative	Alfalfa
Robinia pseudoacacia	Black Locust
Trifolium hybridum	Alsike Clover
T. pratense	Red Clover
T. repens	White Clover
Vicia sativa	Common Vetch
V. villosa	Winter Vetch
Wisteria frutescens	American Wisteria
Fagaceae	
Quercus bicolor	Swamp White Oak
Q. falcata	Southern Red Oak
Q. falcata v. pogodifolia	Cherrybark Oak
Q. lyrata	Swamp Chesnut Oak
Q. macrocarpa	Mossy-Cup Oak
Q. muhlenbergii	Chinquapin Oak
Q. palustris	Pin Oak
Q. phellos	Willow Oak
Q. rubra	Northern Red Oak
Q. shumardii	Shumard Oak
Q. stellata	Post Oak
Q. vetulina	Black Oak
Q. x leana	Hybrid
Geraniaceae	
Geranium carolinianum	Wild Cranesbill
G. maculatum	Wild Geranium
Hamamelidaceae	

Hydrangeaceae	
Hydrangea arborescens	Wild Hydrangea
Juglandaceae	
Carya aquatica	Water Hickory
C. cordiformis	Bitternut Hickory
C. glabra	Pignut Hickory
C. illinoinesis	Pecan
C. laciniosa	Kingnut Hickory
C. ovata	Shagbark Hickory
Juglans cinerea	Butternut
J. nigra	Black Walnut
Lamiaceae	
Lamium amplexicaule	Dead Nettle
Lycopus virginiana	Virginia Bugleweed
Physostegia virginiana	False Dragon-Head
Pycnanthemum virginianum	Virginia Mountain Mint
Stachys aspera	Rough Hedge Nettle
Teucrium canadense	American Germander
Verbena hastata	Blue Vervain
Lauraceae	
Lindera benzoin	Spicebush
Sassafras albidum	Sassafras
Loganiaceae	
Spigelia marilandica	Indian Pink
Magnoliaceae	
Liriodendron tulipifera	Tulip Tree
Magnolia acuminata	Cucumber Magnolia
M. grandiflora	Large-Flower Magnolia
Malvaceae	
Hibiscus moscheutos	Swamp Rose Mallow
Malva sylvestris	High Mallow
Menispermaceae	
Cocculus carolinus	Snailseed
Menispermum canadense	Moonweed
Moraceae	
Maclura pomifera	Osage Orange
Morus alba	White Mulberry
M. rubra	Red Mulberry
Nyssaceae	
Nyssa aquatica	Tupelo Gum
N. sylvatica	Sour Gum
Oleaceae	
Fraxinus americana	White Ash
F. pennsylvanica	Green Ash
Ligustrum sinense	Chinese Privet
Onagraceae	
Epilobium coloratum	Cinnamon Willow
Ludwigia alternifolia	Bushy Seedbox

Ludwigia alternifolia	Bushy Seedbox
L. palustris	Marsh Seedbox
Oenothera biennis	Evening Primrose
Oxalidaceae	
Oxalis dillenii	Yellow Wood Sorrel
O. grandis	Large Wood Sorrel
Papaveraceae	
Corydalis flavula	Pale Corydalis
Phytolaccaceae	
Phytolacca americana	Pokeweed
Plantaginaceae	
Plantago aristata	Buckhorn
P. lanceolata	Ribgrass
P. major	Common Plaintain
Platanaceae	
Platanus occidentalis	American Sycamore
Polemoniaceae	
Phlox divaricata	Smooth Phlox
P. pilosa	Downy Phlox
Polygonaceae	
Rumex acetosella	Red Sorrel
R. crispus	Sour Dock
R. verticillata	Water Dock
Tovara virginiana	Virginia Knotweed
Polypodiaceae	
Polygonum hydropiperoides	Swamp Smartweed
P. lapathifolium	Willow-Weed
P. pennsylvanica	Pennsylvania Smartweed
P. persicaria	Lady's Thumb
Polystichum acrostichoides	Christmas Fern
Portulacaceae	
Claytonia virginica	Spring Beauty
Ranunculaceae	
Ranunculus abortivicus	Small-Flowered Crowfoot
R. acris	Subalpine Butter-Cup
R. recurvatus	Hooked Butter-Cup
R. sceleratus	Celery-Leaf Butter-Cup
Thalictrum thalictroides	Meadow Rye
Rosaceae	
Agrimonia parviflora	Swamp Agrimony
Amelanchier laevis	Smooth Shadbush
Aronia melanocarpa	Black Chokeberry
Crataegus mollis	Downy Hawthorn
C. pruinosa	Prune Hawthorn
C. viridis	Green Hawthron
Fragaria virginiana	Wild Strawberry
Geum canadense	White Avens
Malus sylvestris	Common Apple
Potentilla simplex	Common Cinquefoil

Prunus angustifolia	Chickasaw Plum
P. avium	Sweet Cherry
P. serotina	Black Cherry
P. virginiana	Common Chokeberry
Rosa eglanteria	Sweetbrier
Rubus allegheniensis	Common Blackberry
R. flagellaris	Northern Dewberry
R. multiflora	Multiflora Rose
Rubiaceae	
Cephalanthus occidentalis	Bottonbrush
Galium aparine	Goosegrass
G. coccinnum	Shining Bedstraw
G. trifidum	Small Bedstraw
Houstonia purpurea	Broad-Leaved Bluet
Salicaceae	
Populus alba	White Popular
P. deltoides	Eastern Cottonwood
Salix eriocephala	Missouri River Willow
S. exigua	Sandbar Willow
S. nigra	Black Willow
Sauraraceae	
Saururus cernuus	Lizard's Tail
Scrophulariaceae	
Mimulus alatus	Winged Monkey-Flower
M. ringens	Monkey-Flower
Verbascum thapsus	Wooly Mullein
Veronica angallis-aquatic	Water Speedwell
V. arvensis	Corn Speedwell
Simaroubaceae	
Ailanthus altissima	Tree-of-Heaven
Solanaceae	
Physalis virginiana	Ground Cherry
Tiliaceae	
Tilia americana	Arbor Vitae
Ulmaceae	
Celtis laevigata	Sugarberry
C. occidentalis	Common Hackberry
Ulmus americana	American Elm
U. alata	Winged Elm
U. rubra	Red Elm
Urticaceae	
Boehmeria cylindrica	False Nettle
Laportea canadensis	Wood Nettle
Urtica dioica	Stinging Nettle
Valerianaceae	
Valerianella radiata	Beaked Cornsalad
Violoceae	
Viola cucullata	Marsh Blue Violet

V. missouriensis	Missouri Violet
V. obliqua	Marsh Blue Violet
V. pedata	Birdfoot Violet
V. pubescens	Downy Yellow Violet
V. rafinesquii	Johnny-Jump-Up
V. sororia	Woolly Blue Violet
Vitaceae	
Parthenocissus quinquefolia	Virginia Creeper
Vitis aestivalis	Summer Grape
V. labrusca	Fox Grape
V. riparia	River-Bank Grape
V. vulpina	Frost Grape

Appendix B
Field Data Sheets

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/1/93

Sample Point No.: 1 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	100	1
2. *A. saccharum*	FACU	S	20	1
3. *Dichanthelium dichotomum*	FACU	H	5	1
4. *Lonicera japonica*	FAC	V	5	1
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 50
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
18 inches	B	10YR5/2	10YR4/4	Silt-loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 4 inches
Is soil saturated? Yes x No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: Standing and flowing water in Red Maple stand

Ecophoto-station: Roll 1 Photo No. 1

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/1/93

Sample Point No.: 2 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata* var. *pagodifolia* *	FACW	T	50	1
2. *Ulmus americana*	FACW	T	40	1
3. *Carya ovata*	FAC	S	10	1
4. *Rhus radicans*	FAC	S	20	1
5. *Betula nigra*	FACW	S	20	1
6. *Vitis riparia*	FACW	V	20	1
7.				
8.				
9.				
10.				
11.				
12.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
18 inches	B	10YR5/2	10YR4/4	Silt-loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 6 inches
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 2
* *Q. falcata* var. *pagodifolia* hereafter cited as *Q. falcata* v. *p.*

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/1/93

Sample Point No.: 3 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Dichanthelium dichotomum*	FAC	H	30	1
2. *Juncus effusus*	FACW	H	10	
3. *Cinna arundinacea*	FACW	H	10	
4. *Juncus tenuis*	FACW	H	10	
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
16 inches	B	10YR6/2	10YR5/8	silt-loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 5 inches
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met; AG field

Ecophoto-station: Roll 1 Photo No. 3

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/1/93

Sample Point No.: 4 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer saccaharum*	FACU	T	40	1
2. *Carya ovata*	FAC	T	30	1
3. *Quercus falcata v. p.*	FACW	T	30	1
4. *Carya ovata*	FAC	S	10	1
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-6 inches	A	10YR4/2		
6-18"	B	10YR4/4		

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No x

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? flowing
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes No x
Rationale: Soils non hydric; seasonal water

Ecophoto-station: Roll 1 Photo No. 4

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/1/93

Sample Point No.: 5 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Populus deltoides*	FAC	T	60	1
2. *Salix nigra*	FACW	T	30	1
3. *Quercus bicolor*	FACW	T	10	0
4. *Cornus amomum*	FAC	S	5	1
5. *Rhus radicans*	FAC	S	5	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/1	7.5YR5/8	silty clay loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 5

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/1/93

Sample Point No.: 6 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata* v. *p.*	FACW	T	80	1
2. *Carya ovata*	FAC	T	20	1
3. *Ulmus alata*	FACU	S	20	1
4. *Lonicera japonica*	FAC	V	30	1
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/1	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 24"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 6

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/2/93

Sample Point No.: 7 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Festuca aruandinacea*	FACU	H	30	1
2. *Xanthium strumarium*	FAC	H	20	1
3. *Scirpus atrovirens*	FACW	H	10	0
4. *Ulmus americana*	FACW	T	10	1
5. *Quercus falcata*	FACW	T	10	1
6. *Populus deltoides*	FAC	T	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-8"	B	10YR5/1	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 8"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 7

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/2/93

Sample Point No.: 8 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	60	1
2. *Ulmus americana*	FACW	T	20	0
3. *U. alata*	FACU	S	10	1
4. *Lonicera japonica*	FAC	V	20	1
5. *Glyceria striata*	OBL	H	5	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-8"	disturbed	10YR5/2	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 8

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/2/93

Sample Point No.: 9 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	40	1
2. *Plantus occidentalis*	FACW	T	30	1
3. *Quercus falcata v. p.*	FACW	T	10	0
4. *Ulmus americanus*	FACW	T	30	1
5. *U. alatus*	FACU	S	10	1
6. *Alnus serrulata*	FACW	S	2	0
7. *Symphoricarpus orbiculatus*	UPL	S	5	1
8. *Lonicera japonica*	FAC	V	10	1
9. *Glyceria striata*	OBL	H	2	1
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 72
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-10"	B	10YR5/2	dark red	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria are met

Ecophoto-station: Roll 1 Photo No. 9

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/2/93

Sample Point No.: 10 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. Acer rubrum	FAC	S	50	1
2. Glyceria striata	FAC	H	10	1
3. Onoclea sensibilis	FACW	H	30	1
4. Agrostis gigantea	FAC	H	5	0
5.				
6. Adjacent to sample point				
7. Celtis laevigata				
8. Sambucus canadensis				
9. Salix nigra				
10. Cinna arundinacea				
11. Plantus occidentalis				
12. Corydalis flavula				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/2	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 13

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/2/93

Sample Point No.: 11 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	60	1
2. *Liquidambar styraciflua*	FAC	T	30	1
3. *Acer rubrum*	FAC	T	5	0
4. *Ulmus americana*	FACW	S	5	1
5. *Plantus occidentalis*	FACW	S	2	1
6. *Quercus falcata*	FACW	S	2	1
7. *Glyceria striata*	FAC	H	2	1
8. *Allium vineale*	FACU	H	2	1
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/2	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 14

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 12 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Populus deltoides*	FAC	T	60	1
2. *Quercus palustris*	FACW	T	5	0
3. *Ambrosia trifida*	FACU	H	60	1
4. *Aster lateriflorus*	FACW	H	30	1
5. *Elymus virginicus*	FACW	H	10	0
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/4	7.5YR5/8	loamy fine sand

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 14"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 15

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 13 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Glyceria striata*	FAC	H	80	1
2. *Dichanthelium dichotomum*	FAC	H	10	0
3. *Festuca arundinacea*	FACU	H	10	0
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
gravel/disturbed				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No ?

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: old parking area? ponded water area had spring peepers

Ecophoto-station: Roll 1 Photo No. 16

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 14 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata* v. *p.*	FACW	T	40	1
2. *Acer rubrum*	FAC	T	40	1
3. *Salix nigra*	FACW	T	10	0
4. *Ulmus americana*	FACW	S	5	1
5. *Rhus radicans*	FAC	S	5	1
6. *Elymus virginicus*	FACW	H	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/2	7.5YR5/8	silty clay loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 12"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 17

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 15 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus palustris*	FACW	S	10	1
2. *Salix nigra*	FACW	S	40	1
3. *Juncus effusus*	FACW	H	60	1
4. *Polygonum lapathifolium*	OBL	H	20	1
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/1	7.5YR5/6	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 24"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 18

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 16 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	S	10	1
2. *Typha latifolia*	OBL	H	10	1
3. *Juncus effusus*	FACW	H	5	1
4. *Bidens cernua*	OBL	H	5	1
5. *Salix exigua*	OBL	S	10	1
6. *Asclepias incarnata*	OBL	H	2	1
7. *Ludwigia alternifolia*	FACW	H	2	1
8. *Cornus amomum*	FAC	S	5	1
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
disturbed/ man-made				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No ?

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? > 5'
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: old man made ponds

Ecophoto-station: Roll 1 Photo No. 19, 20

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 17 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Andropogon virginicus*	FACU	H	20	1
2. *Epilobium coloratum*	OBL	H	5	0
3. *Elymus virginicus*	FACW	H	5	0
4. *Juncus tenius*	FACW	H	20	1
5. *Dichanthelium dichotomum*	FAC	H	10	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 67
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
gravel/ disturbed				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No ?

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 6"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: vegetation and hydrology present

Ecophoto-station: Roll 1 Photo No. 22

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 18 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Nyssa sylvatica*	FAC	S	20	!
2. *Acer rubrum*	FAC	S	35	1
3. *Betula nigra*	FACW	S	35	1
4. *Lonicera tartaria*	FACU	S	20	1
5. *Cinna arundinacea*	FACW	H	30	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100

Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/1	none	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 6"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 23, 24

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 19 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Nyssa sylvatica*	FAC	T	10	0
2. *Carya ovata*	FAC	T	40	1
3. *Quercus falcata v. p.*	FACW	T	20	1
4. *Q. bicolor*	FACW	T	10	0
5. *Plantus occidentalis*	FACW	T	5	0
6. *Celtis laevigata*	FACW	T	5	0
7. *Rhus radicans*	FAC	S	5	1
8. *Lonicera tartaria*	FAC	S	5	1
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/2	none	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met; stump with 95+ growth rings

Ecophoto-station: Roll 2 Photo No. 1, 2

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/3/93

Sample Point No.: 20 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata* v. *p.*	FACW	T	20	1
2. *Betula nigra*	FACW	T	35	1
3. *Prunus serotina*	FACU	T	5	0
4. *Aralia spinosa*	FAC	S	30	1
5. *Salix nigra*	FACW	T	30	1
6. *Sassafras albidum*	FACU	S	5	0
7. *Elymus virginicus*	FACW	H	5	1
8. *Fraxinus pennsylvanica*	FACW	S	10	1
9. Adjacent				
10. *Plantus occidentalis*				
11. *Vitis riparia*				
12. *Quercus stellata*				
13. *Symphoricarpus orbiculatus*				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/3	none	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No x

HYDROLOGY

Is the ground surface inundated? Yes No x Depth?
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes No x Secondary? Yes No x
Is the wetland criteria met? Yes No x

DETERMINATION AND RATIONALE

Is the area a wetland? Yes No x
Rationale: only hydrophytic vegetation met; floodplain

Ecophoto-station: Roll 2 Photo No. 3

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 21 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Gleditsia aquatica*	OBL	T	20	1
2. *Betula nigra*	FACW	T	40	1
3. *Quercus palustris*	FACW	T	10	0
4. *Plantus occidentalis*	FAC	T	10	0
5. *Alnus serrulata*	FACW	S	10	1
6. *Acer rubrum*	FAC	S	5	1
7. *Cephalanthus occidentalis*	OBL	S	5	1
8. *Carex stipata*	FACW	H	20	1
9. *Glyceria stricta*	FAC	H	30	1
10. *Ludwigia alternifolia*	FACW	H	2	0
11. *Cinna arundinacea*	FACW	H	5	0
12. *Salix exiqua*	FACW	S	5	1
13. *Vitis riparia*	FAC	V	5	1

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/1	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 12"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 4

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 22 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Fraxinus pennsylvanica*	FACW	T	30	1
2. Acer rubrum	FAC	T	40	1
3. *Salix nigra*	FACW	T	10	0
4. *Nyssa sylvatica*	FAC	T	10	0
5. *Betula nigra*	FACW	S	5	1
6. *Acer saccharinum*	FACW	T	5	0
7. *Liquidambar styraciflua*	FAC	S	2	1
8. *Vitis riparia*	FAC	V	5	1
9. *Aspleniun platyneuron*	FACU	H	2	1
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 83
Is the hydrophytic vegetation criterion met? Yes 83 No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/1	7.5YR6/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 4"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 6

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 23 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer saccharinum*	FACW	T	20	1
2. *Quercus falcata v. p.*	FACW	T	20	1
3. *Salix nigra*	FACW	T	5	0
4. *Betula nigra*	FACW	S	5	1
5. *Fraxinus pennsylvanica*	FACW	S	10	1
6. *Celtis laevigatis*	FACW	S	5	1
7. Symphoricarpus orbiculatus	FAC	S	2	0
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
incised/cut				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No ?

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3'+
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: hydrology and vegetation in old stream channel

Ecophoto-station: Roll 2 Photo No. 7

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 24 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	15	1
2. *Acer rubrum*	FAC	T	25	1
3. Nyssa sylvatica	FACW	T	20	1
4. *Liquidambar styraciflua*	FAC	T	10	0
5. *Glyceria striata*	FAC	H	5	1
6. *Loniceria japonica*	FAC	V	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/1	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 8

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 25 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Typha latifolia*	OBL	H	60	1
2. *Juncus tenius*	FACW	H	10	0
3. *Scirpus polyphyllus*	OBL	H	2	0
4. Carex stipata	FACW	H	5	0
5.				
6. Edge				
7. *Salix exigua*				
8. *Betula nigra*				
9. *Salix nigra*				
10. *Quercus stellata*				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
man made borrow pit				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No ?

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 1'+
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: vegetation and hydrology, abandoned pit

Ecophoto-station: Roll 2 Photo No. 9

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 26 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata v. p.*	FACW	T	30	1
2. *Carya ovata*	FAC	T	30	1
3. *Quercus palustris*	FACW	T	10	0
4. *Q. alba*	FACU	T	10	0
5. *Ulmus alata*	FACU	S	2	1
6. *Fraxinus pennsylvanica*	FACW	S	5	1
7. *Lonicera japonica*	FAC	V	2	1
8. *Cinna arundinacea*	FACW	H	5	1
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 83
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/1	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 10

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 27 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	30	1
2. *Plantus occidentalis*	FACW	T	20	1
3. *Acer rubrum*	FAC	T	40	1
4. *Quercus bicolor*	FACW	T	10	0
5. *Allium vineale*	FACU	H	5	1
6. *Rhus radicans*	FAC	V	2	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/1	7.5YR6/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 4"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 11

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 28 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	50	1
2. *Acer rubrum*	FAC	T	30	1
3. *Nyssa sylvatica*	FACW	T	10	0
4. *Ulmus americana*	FACW	T	10	0
5. *Glyceria striata*	FAC	H	5	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/1	7.5YR6/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes x No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 12

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 29 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus alba*	FACU	T	30	1
2. *Ulmus americana*	FACW	S	10	1
3. *Quercua falcata*	FACW	T	30	1
4. *Carya ovata*	FAC	T	10	0
5. *Celtis laevigata*	FACW	S	10	1
6. *Acer rubrum*	FAC	S	10	1
7. *Rhus radicans*	FAC	S	20	1
8. *Vitis riparia*	FAC	V	5	1
9. *Cinna aruandinacea*	FACW	H	5	1
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR5/1	7.5YR6/6	Silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 13

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/4/93

Sample Point No.: 30 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	30	1
2. *Acer rubrum*	FAC	T	30	1
3. *Fraxinus pennsylvanica*	FACW	T	20	1
4. *Plantus occidentalis*	FACW	T	5	0
5. *Glyceria striata*	FAC	H	5	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/1	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 5"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 14

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/5/93

Sample Point No.: 31 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	30	1
2. *Acer rubrum*	FAC	T	40	1
3. *Carya ovata*	FAC	T	20	1
4. *Nyssa sylvatica*	FACW	T	10	0
5. *Rhus radicans*	FAC	S	5	1
6. *Dichanthelium dichotomum*	FAC	H	5	1
7. *Lonicera japonica*	FAC	V	5	1
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/1	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 15

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 3/5/93

Sample Point No.: 32 Site Name: PGP, KY

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	S	70	1
2. *Ulmus americana*	FACW	S	10	0
3. *Nyssa sylvatica*	FACW	S	10	0
4. *Carya ovata*	FAC	S	5	0
5. *Quercus palustris*	FACW	S	5	0
6.				
7.				
8.				
9.				
10				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10YR6/2	7.5YR5/8	silt loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 2 Photo No. 17

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/5/93

Sample Point No.: 33 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Schizachyrium scoparium*	FAC	H	90	1
2. *Panicum dichotomiflorum*	FAC	H	5	0
3. *Juncus tenius*	FACW	H	5	0
4. *Glyceria striata*	OBL	H	2	0
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	2.5 Y 5/1	7.5 YR 6/1	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 1

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/5/93

Sample Point No.: 34 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata* v. *p.*	FACW	T	60	1
2. *Carya ovata*	FACU	T	10	0
3. *C. ovata*	FACU	S	20	1
4. *Quercu palustris*	FACW	T	10	0
5. *Fraxinus pennsylvanica*	FACW	T	10	0
6. *Nyssa sylvatica*	FAC	T	10	0
7. *Rhus radicans*	FAC	S	30	1
8. *Lonicera japonica*	FAC	V	5	1
9. *Gylceria striata*	OBL	H	2	1
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	2.5 Y 5/1	7.5 YR 6/1	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 12"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 2 criteria met

Ecophoto-station: Roll 1 Photo No. 2

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/5/93

Sample Point No.: 35 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus palustris*	FACW	T	50	1
2. *Q. falcata v. p.*	FACW	T	30	1
3. *Nyssa sylvatica*	FAC	T	10	0
4. *Acer rubrum*	FAC	T	10	0
5. *Rhus radicans*	FAC	S	20	1
6. *Lonicera japonica*	FAC	V	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	2.5 Y 5/1	7.5 YR 6/1	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 1"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 3

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/5/93

Sample Point No.: 36 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer saccharinum*	FACW	T	10	0
2. *Fraxinus pennsylvanica*	FACW	T	5	0
3. *Betula nigra*	FACW	T	60	1
4. *Liquidambar styraciflua*	FAC	T	15	0
5. *Acer rubrum*	FAC	T	15	0
6. *Allium vineale*	FACU	H	10	1
7. *Lonicera japonica*	FAC	V	20	1
8. *Quercus falcata*	FAC	S	10	1
9. *Glyceria striata*	OBl	H	2	0
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	2.5 Y 5/1	7.5 YR 6/1	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 1-2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 5

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/5/93

Sample Point No.: 37 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	60	1
2. *Ulmus americana*	FACW	T	20	0
3. *Robinia pseudoacacia*	FACU	T	10	0
4. *Allium venerale*	FACU	H	5	1
5. *Lonicera japonica*	FAC	V	2	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 66
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	B	10 YR 5/1	10 YR 5/6	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 6

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/5/93

Sample Point No.: 38 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	60	1
2. *Plantus occidentalis*	FAC	T	10	0
3. *Fraxinus pennsylvanica*	FACW	T	20	0
4. *Lonicera japonica*	FAC	V	20	1
5. *Aspleniun platyneuron*	FACU	H	2	1
6. *Nyssa sylvatica*	FAC	S	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 5/2	7.5 YR 7/6	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 1-2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 7

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/6/93
Sample Point No.: 39 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Glyceria striata*	OBL	H	5	0
2. *Stachya aspera*	FACW	H	2	0
3. *Cardamine pennsylvanica*	FAC	H	5	0
4. *Rosa multiflora*	FACU	H	10	0
5. *Leersia oryzoides*	FACW	H	80	1
6. *Asclepias incarnata*	OBL	H	10	0
7. *Physalis virginicus*	UPl	H	2	0
8. *Apocynum cannabinum*	FACU	H	1	0
9. *Quercus bicolor*	FACW	S	20	1
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
ponded water area				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? > 5'
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all criteria met

Ecophoto-station: Roll 1 Photo No. 8

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/6/93

Sample Point No.: 40 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata* v. *p.*	FACW	T	40	1
2. *Ulmus americana*	FACW	T	20	1
3. *Acer rubrum*	FAC	T	20	1
4. *Celtis laevigatus*	FACW	T	10	0
5. *Liquidambar styraciflua*	FAC	T	20	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 4/2	7.5 yr 5/6	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 12"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: alll 3 criteria met

Ecophoto-station: Roll 1 Photo No. 9

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/6/93

Sample Point No.: 41 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	50	1
2. *Acer rubrum*	FAC	T	30	1
3. *Lonicera japonica*	FAC	V	5	1
4. *Glyceria striata*	OBL	H	10	1
5. *Quercus bicolor*	FACW	S	10	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 5/2		sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 10

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/6/93

Sample Point No.: 42 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Zea mays*	UPL	H	95	1
2. *Physalis virginiana*	UPL	H	5	1
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 0
Is the hydrophytic vegetation criterion met? Yes_____ No x

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-2	A	10 YR 4/2	7.5 YR 5/6	sil
2-12	A	10 YR 5/4	" "	"

Series/Phase:_____ Subgroup:_____
Hydric soil indicators:_____
Is the hydric soil criterion met? Yes x No_____

HYDROLOGY

Is the ground surface inundated? Yes x No_____ Depth? 2"
Is soil saturated? Yes_____ No_____
Depth to free-standing water in pit/soil probe hole:_____
Primary Indicators? Yes x No_____ Secondary? Yes____ No____
Is the wetland criteria met? Yes x No_____

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No____
Rationale: standing water: prior converted wetland

Ecophoto-station: Roll 1 Photo No. 11

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/6/93

Sample Point No.: 43 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Tripsacum dactyloides*	FACW	H	40	1
2. *Festuca aruandinacea*	FACU	H	25	1
3. *Juncus effusus*	FACW	H	10	0
4. *Onoclea sensibilis*	FACW	H	5	0
5. *Lespedeza cuneata*	FACU	H	2	0
6. *Panicum dichotomiflorum*	FAC	H	5	0
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 60
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 4/2	7.5 YR 4/6	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 12

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/6/93

Sample Point No.: 44 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	100	1
2. *Vitis riparia*	FACW	V	5	1
3. *Glyceria striata*	OBL	H	10	1
4. *Cinna arundinacea*	FACW	H	5	1
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
1-12"	A	10 YR 5/2		sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 3"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 13

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/7/93

Sample Point No.: 45 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata v. p.*	FACW	T	40	1
2. *Liquidambar styraciflua*	FAC	T	30	1
3. *Carya ovata*	FACU	T	10	1
4. *Vitis riparia*	FACW	V	5	1
5. *Symphoricarpus orbiculatus*	FACW	S	5	1
6. *Glyceria striata*	OBL	H	5	1
7. *Carex stricta*	FACW	H	2	1
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 6/2	10 YR 4/4	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 12"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: al 3 criteria met

Ecophoto-station: Roll 1 Photo No. 15

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/7/93

Sample Point No.: 46 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	60	1
2. *Betula nigra*	FACW	T	30	1
3. *Liquidambar styraciflua*	FAC	T	10	0
4. *Allium venerale*	FACU	H	20	1
5. *Glyceria striata*	OBL	H	5	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 5/2	10 YR 4/3	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 1"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 17

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/7/93

Sample Point No.: 47 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata*	FAC	T	60	1
2. *Carya ovata*	FACU	T	10	0
3. *Quercus macrocarpa*	FAC	T	5	0
4. *Nyssa sylvatica*	FAC	T	20	1
5. *Glyceria striata*	OBL	H	5	1
6. *Carex striata*	FACW	H	2	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 Yr 5/1	7.5 YR 4/6	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 2"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 19

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/7/93

Sample Point No.: 48 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Quercus falcata v. p.*	FACW	T	40	1
2. *Q. palustris*	FACW	T	40	1
3. *Liquidambar styraciflua*	FAC	T	10	0
4. *Acer rubrum*	FAC	T	10	0
5. *A. rubrum*	FAC	S	5	1
6. *Carya ovata*	FACU	S	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 5/1	7.5 YR 6/8	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 6"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 20

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/8/93

Sample Point No.: 49 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Nyssa sylvatica*	FAC	T	20	1
2. *Quercus palustris*	FACW	T	40	1
3. *Q. falcata v. p.*	FACW	T	30	1
4. *Lonicera japonica*	FAC	V	5	1
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 5/1	7.5 YR 6/8	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 1"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll 1 Photo No. 21

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/8/93

Sample Point No.: 50 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Betula nigra*	FACW	T	50	1
2. *Gleditsia triocanthos*	FAC	T	30	1
3. *Liquidambar styraciflua*	FAC	T	10	0
4. *Cinna arundinacea*	FACW	H	5	1
5. *Lonicera japonica*	FAC	V	10	1
6. *Tilia americana*	FACU	S	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 5/2	10 YR 5/4	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes No x Depth?
Is soil saturated? Yes x No
Depth to free-standing water in pit/soil probe hole: within 12"
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll R Photo No. 16

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 4/8/93

Sample Point No.: 51 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	60	1
2. *Betula nigra*	FACW	T	20	1
3. *Ulmua alata*	FACU	S	10	1
4. *Lonicera japonica*	FAC	V	5	1
5. *Glyceria striata*	OBL	H	5	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-18"	A/B	10 YR 4/1	7.5 YR 5/6	sil

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? 1"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 criteria met

Ecophoto-station: Roll R Photo No. 17

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5/10/93

Sample Point No.: 55 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer saccharinum*	FACW	T	60	1
2. *Celtis laevigata*	FACW	T	30	1
3. *Fraxinus pennsylvanica*	FACW	T	10	0
4. *Betula nigra*	FACW	T	2	0
5. *Rhus radicans*	FAC	V	10	1
6. *Chasmanthium latifolium*	FACU	H	5	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10 YR 5/2	7.5 YR 3/4	SIL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes No Depth?
Is soil saturated? Yes x No
Depth to free-standing water in pit/soil probe hole: 12"
Primary Indicators? Yes No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all three parameters met

Ecophoto-station: Roll 1 Photo No. 3

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-10-93

Sample Point No.: 56 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Fraxinus pennsylvanica*	FACW	T	40	1
2. *Carya ovata*	FAC	T	30	1
3. *Celtis occidentalis*	FACU	T	20	1
4. *Acer rubrum*	FAC	T	10	0
5. *Glyceria striata*	FACW	H	10	1
6. *Rhus radicans*	FAC	V	10	1
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR4/3		
12-15"	B	10YR5/2	2.5YR3/6	SIL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes No x Depth?
Is soil saturated? Yes No x
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes No Secondary? Yes x No
Is the wetland criteria met? Yes x No Rhizosperes at 15"

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 8

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-10-93

Sample Point No.: 57 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Gleditsia aquatica*	OBL	T	20	1
2. *Quercus falcata v. p.*	FACW	T	60	1
3. *Lonicera japonica*	FAC	V	50	1
4. *Sassafras albidum*	FACU	S	10	1
5. *Lemna minor*	OBL	H	60	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR6/2	5YR5?8	SIL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? >12"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 10

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-10-93

Sample Point No.: 58 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Plantus occidentalis*	FAC	T	30	1
2. *Acer saccharinum*	FACW	T	30	1
3. *Fraxinus pennsylvanica*	FACW	T	20	1
4. *Celtis laevigata*	FACW	T	10	0
5. *Planera aquatic*	OBL	T	5	0
6. *Acer rubrum*	FAC	T	5	0
7. *Trovaria virginiana*	FAC	H	20	1
8. *Trillium recurvatum*	UPL	H	5	0
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR3/3	none	SICL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes No x

HYDROLOGY

Is the ground surface inundated? Yes No Depth?
Is soil saturated? Yes x No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No water marks at 4'

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 11

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-10-93

Sample Point No.: 59 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Fraxinus pennsylvanica*	FACW	T	30	1
2. *Quercus lyrata*	OBL	T	10	0
3. *Q. falcata v. p.*	FACW	T	5	0
4. *Betula nigra*	FACW	T	5	0
5. *Celtis laevigatis*	FACW	T	40	1
6. *Ulmus americanus*	FACW	T	10	0
7. *Acer saccharinum*	FACW	T	20	1
8. *Plantunus occidentalis*	FAC	T	10	0
9. *Campsis radicans*	UPL	V	5	1
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR4/4	None (ponded)	SICL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? >12"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 13

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-11-93

Sample Point No.: 60 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer saccharinum*	FACW	T	30	1
2. *Celtis laevigatus*	FACW	T	30	1
3. *Quercus falcata*	FACW	T	30	1
4. *Populus deltiodes*	FAC	T	20	0
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
flooded				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? > 72"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 14

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-11-93

Sample Point No.: 61 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Salix nigra*	FACW	T	20	1
2. *Cephalanthus occidentalis*	OBL	S	30	1
3. *Fraxinus pennsylvanica*	FACW	T	20	1
4. *Hibiscus moscheutos*	OBL	H	5	1
5. *Rumex verticillata*	OBL	H	10	1
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR5/2	7.5YR5/6	SIL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? >3'
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 15

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-11-93

Sample Point No.: 62 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Cephalanthus occidentalis*	OBL	S	20	1
2. *Wisteria frutescens*	FACW	V	10	1
3. *Ulmus americana*	FACW	S	12	1
4. *Rumex verticillata*	OBL	H	20	1
5. *Lemna minor*	OBL	H	30	1
6. *Veronica angallis-aquatica*	OBL	H	5	0
7. *Asclepias incarnata*	OBL	H	2	0
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
ponded				

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? > 3'
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 16

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-11-93

Sample Point No.: 63 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Nyssa aquatica*	OBL	T	30	1
2. *Taxodium distichum*	OBL	T	10	0
3. *Quercus falcata*	FACW	T	20	1
4. *Q. bicolor*	FACW	T	10	0
5. *Ulmus american*	FACW	T	20	1
6. *Populus deltiodes*	FAC	T	20	1
7. *Cephalanthus occidentalis*	OBL	S	10	1
8. *Celtis laevigatus*	FACW	S	5	1
9. *Carya aquatica*	OBL	T	10	0
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture

ponded/flooded

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? > 24"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 15

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-12-93

Sample Point No.: 64 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Onoclea sensibilis*	FACW	H	75	1
2. *Valerianella radiata*	UPL	H	2	0
3. *Carex vulpinoides*	FACW	H	5	0
4. *C. lupilina*	FACW	H	5	0
5. *C. granularis*	FACW	H	5	0
6. *C. rosea*	FACW	H	2	0
7. *C. crinita*	FACW	H	5	0
8. *Cinna arundinacia*	FACW	H	2	0
9. *Glyceria striata*	OBL	H	5	0
10. *Festuca arundinacea*	FACU	H	1	0
11. *Acer rubrum*	FAC	S	5	1
12. *Fraxinus pennsylvanica*	FACW	S	5	1
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR5/2	7.5YR5/6	SL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes No x Depth?
Is soil saturated? Yes x No
Depth to free-standing water in pit/soil probe hole: to surface
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 parameters met

Ecophoto-station: Roll 1 Photo No. 22

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-12-93

Sample Point No.: 65 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Taxodium distichum*	OBL	T	10	1
2. *Betula nigra*	FACW	T	15	1
3. *Cephalanthus occidentalis*	OBL	S	15	1
4. *Celtis laevigatus*	FACW	S	10	1
5. *Acer rubrum*	FAC	S	15	1
6. *Lemna minor*	OBL	H	20	1
7. *Spirodela polyrhiza*	OBL	H	10	1
8. *Glyceria striata*	OBL	H	10	1
9. *Hibiscus moscheutos*	OBL	H	5	0
10. *Epilobium coloratum*	FACW	H	2	0
11. *Saururus cernuus*	OBL	H	5	0
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR5/1	7.5YR5/8	loam

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? > 3'
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: alll 3 parameters met

Ecophoto-station: Roll 2 Photo No. 2

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-13-93

Sample Point No.: 66 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Juncus effusus*	FACW	H	20	1
2. *J. canadensis*	OBL	H	30	1
3. *Andropogon virginicus*	FACU	H	5	0
4. *Lespedeza cuneata*	NI	H	5	0
5. *Lycopus virginiana*	OBL	H	2	0
6. *Asclepias incarnata*	FACW	H	5	0
7. *Veronica angallis-aquatica*	OBL	H	2	0
8. *Betula nigra*		S	2	1
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR4/6	10YR8/4	SL

Series/Phase: Subgroup:
Hydric soil indicators: ponded water
Is the hydric soil criterion met? Yes x No

HYDROLOGY

Is the ground surface inundated? Yes x No Depth? > 6"
Is soil saturated? Yes No
Depth to free-standing water in pit/soil probe hole:
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes No
Rationale: all parameters met

Ecophoto-station: Roll 2 Photo No. 5

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: Lichvar and Pringle Date: 5-13-93

Sample Point No.: 67 Site Name: PGP

VEGETATION

Dominant Species	Indicator Status	Stratum	% Cover	Total Dominance Measure
1. *Acer rubrum*	FAC	T	80	1
2. *Acer saccharinum*	FACW	T	20	1
3. *Glyceria striata*	OBL	H	5	1
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes x No

SOILS

Profile Description:

Depth	Horizon	Matrix Color	Mottle	Texture
0-12"	A	10YR6/2	10YR5/6	SL

Series/Phase: Subgroup:
Hydric soil indicators:
Is the hydric soil criterion met? Yes x No

HYDROLOGY

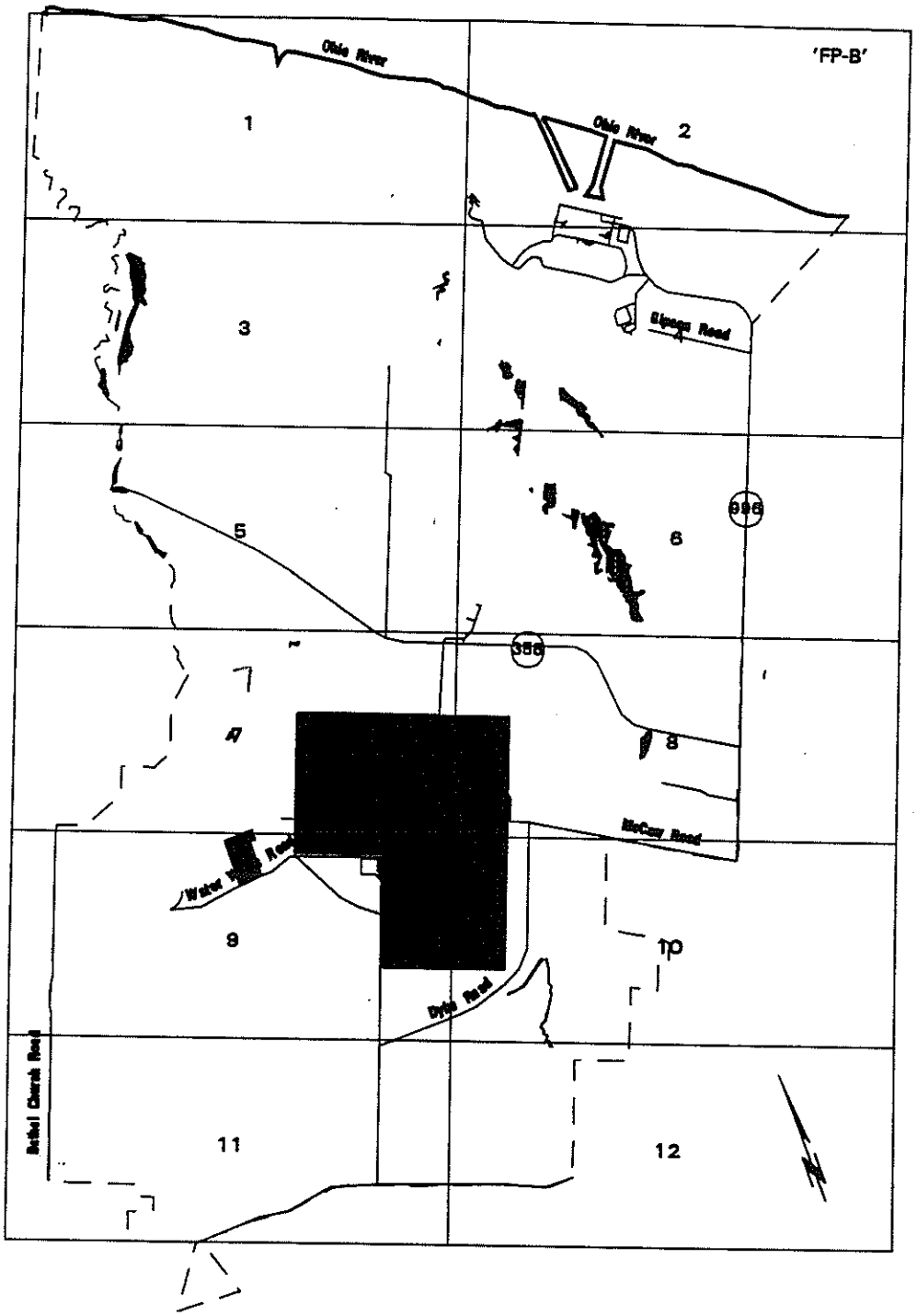
Is the ground surface inundated? Yes No x Depth?
Is soil saturated? Yes x No
Depth to free-standing water in pit/soil probe hole: to surface
Primary Indicators? Yes x No Secondary? Yes No
Is the wetland criteria met? Yes x No

DETERMINATION AND RATIONALE

Is the area a wetland? Yes x No
Rationale: all 3 paramters met

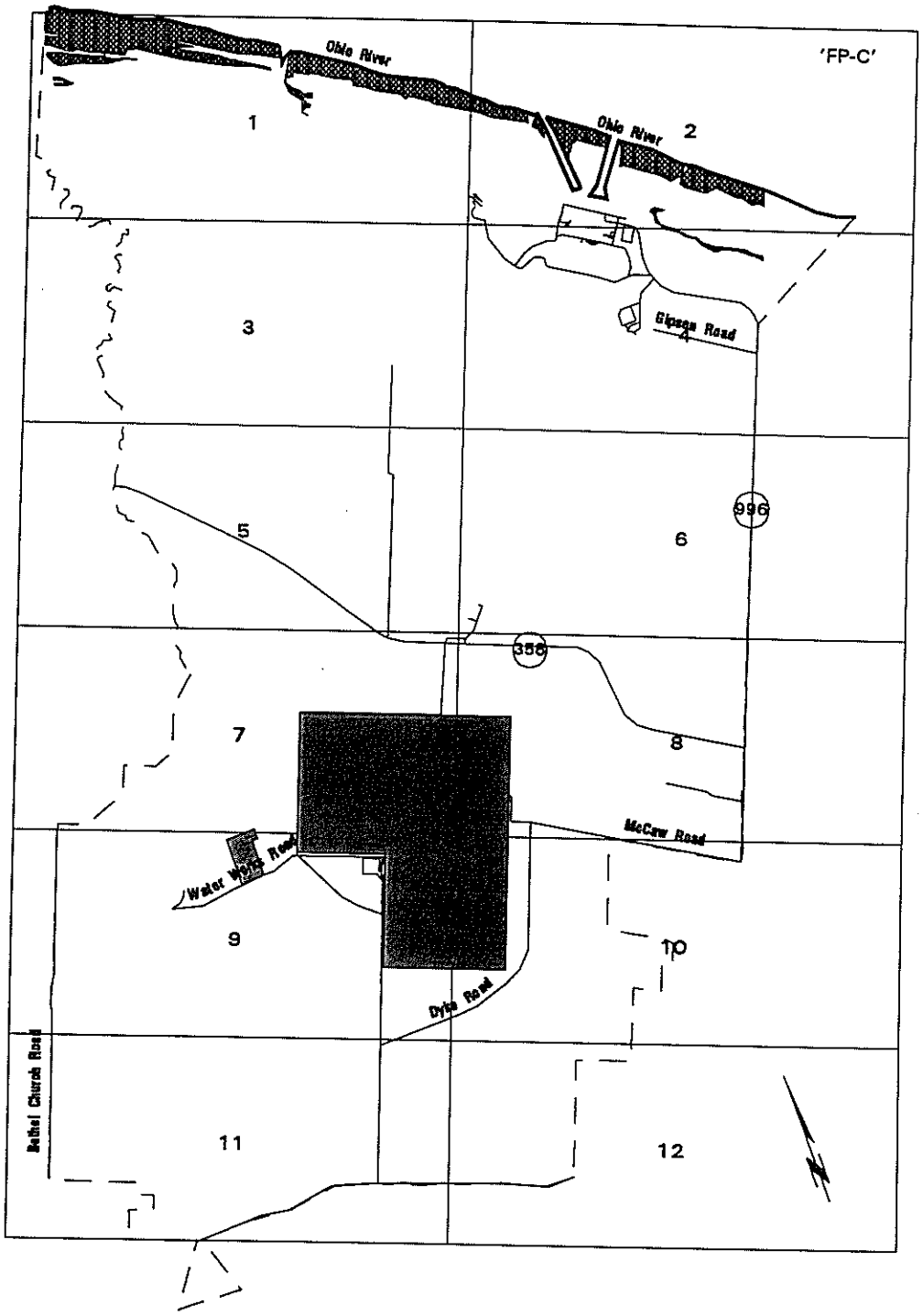
Ecophoto-station: Roll 2 Photo No. 8

Appendix C
Cover Type Photographs and Corresponding Distribution Maps



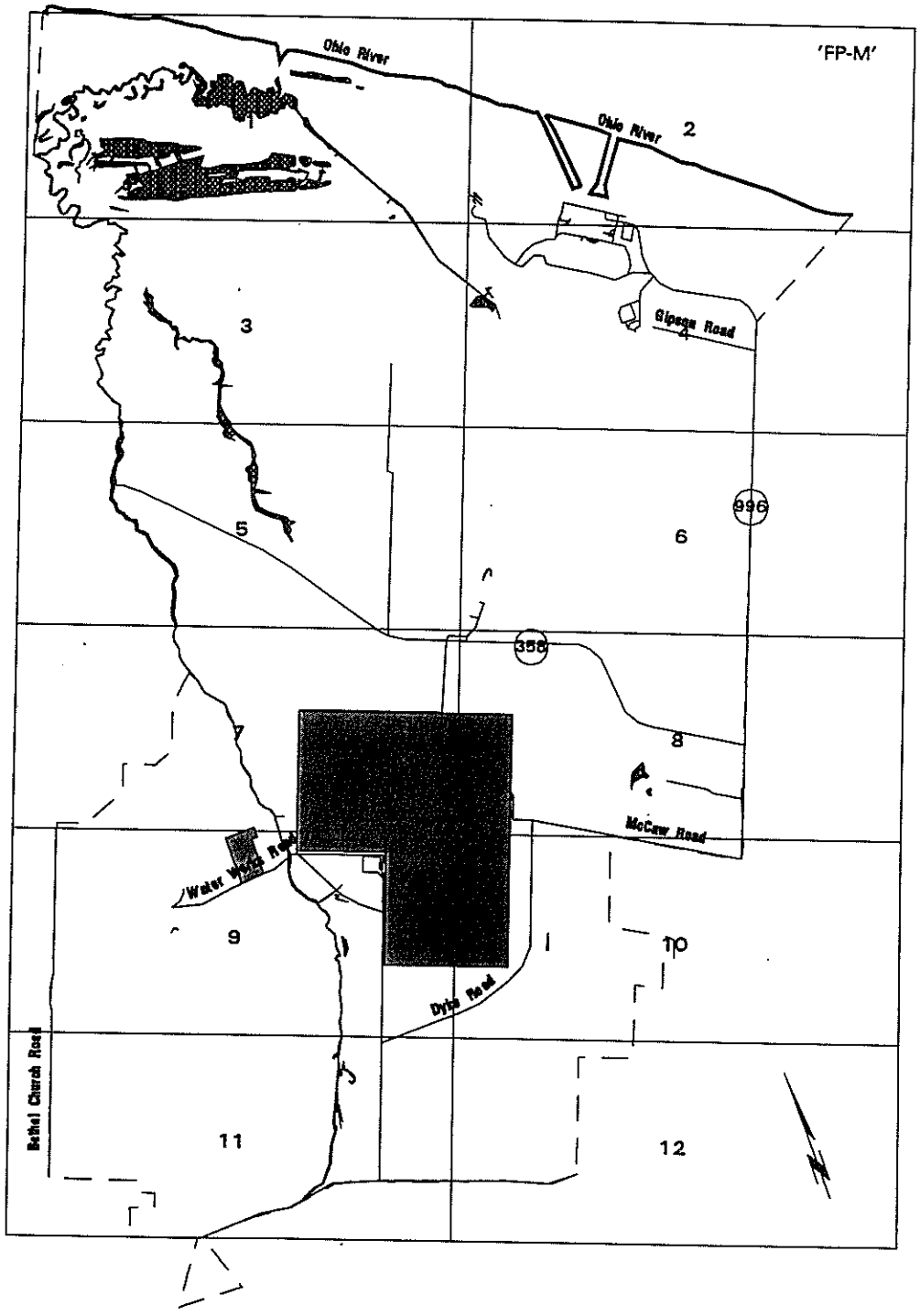
C.1
Distribution of Cover Type
Flood Plain-Birch (FP-B)

Photo 1
Cover Type: Flood Plain-Birch (FP-B)
Sample Point 22



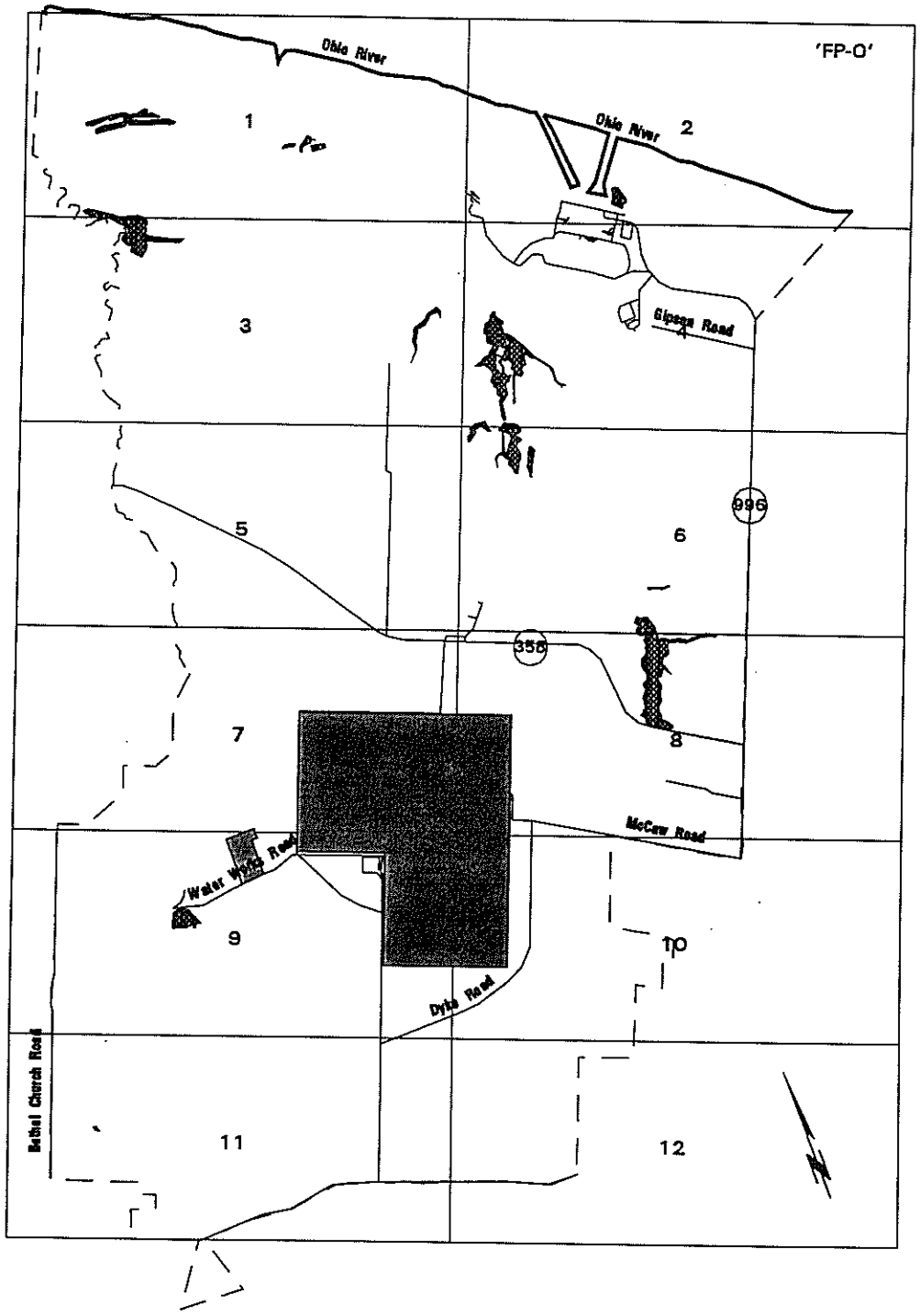
C.2
Distribution of Cover Type
Flood Plain-Cottonwood (FP-C)

Photo 2
Cover Type: Flood Plain-Cottonwood (FP-C)
Sample Point 58



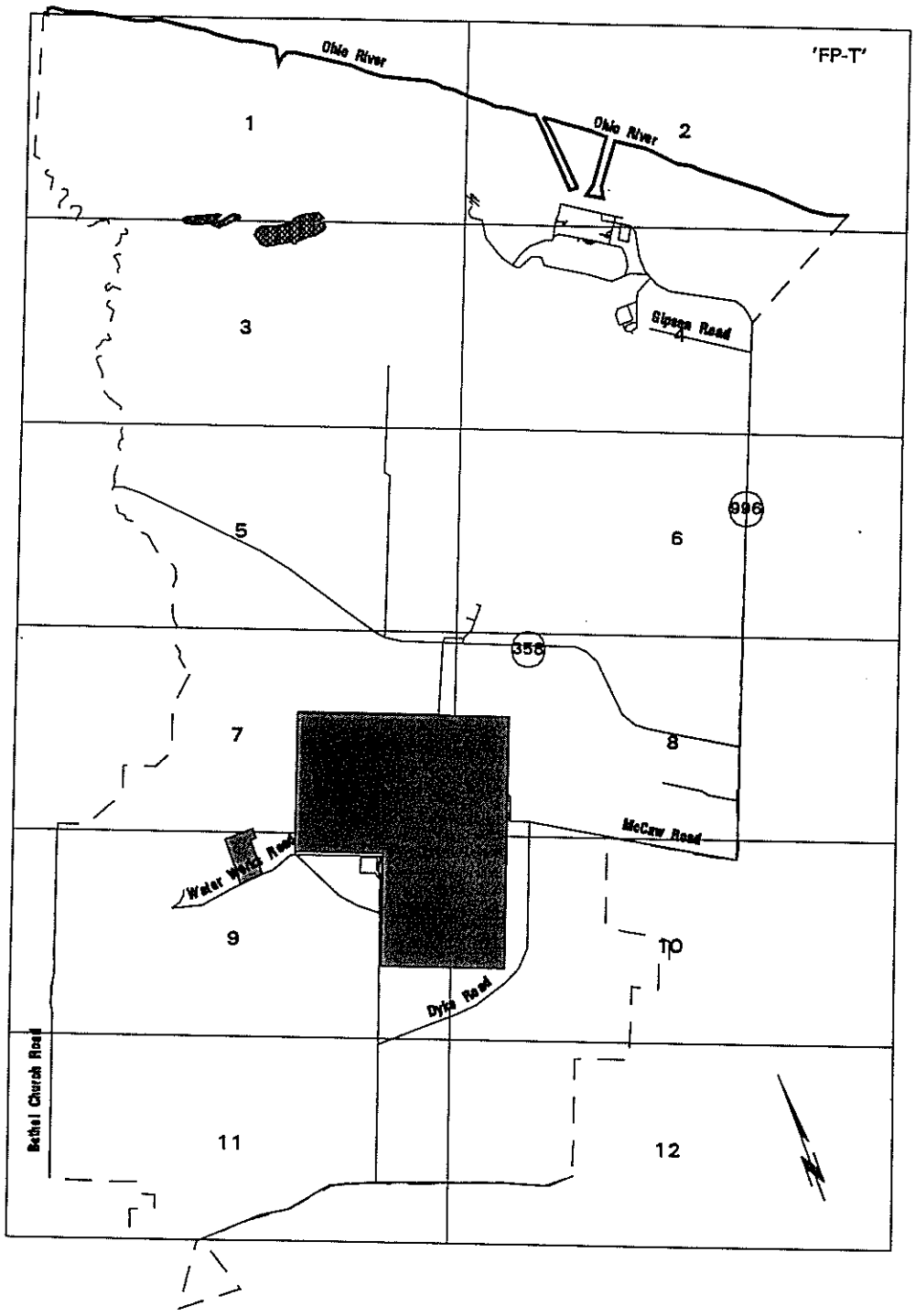
C.3
Distribution of Cover Type
Flood Plain-Maple (FP-M)

Photo 3
Cover Type: Flood Plain-Maple (FP-M)
Sample Point 60



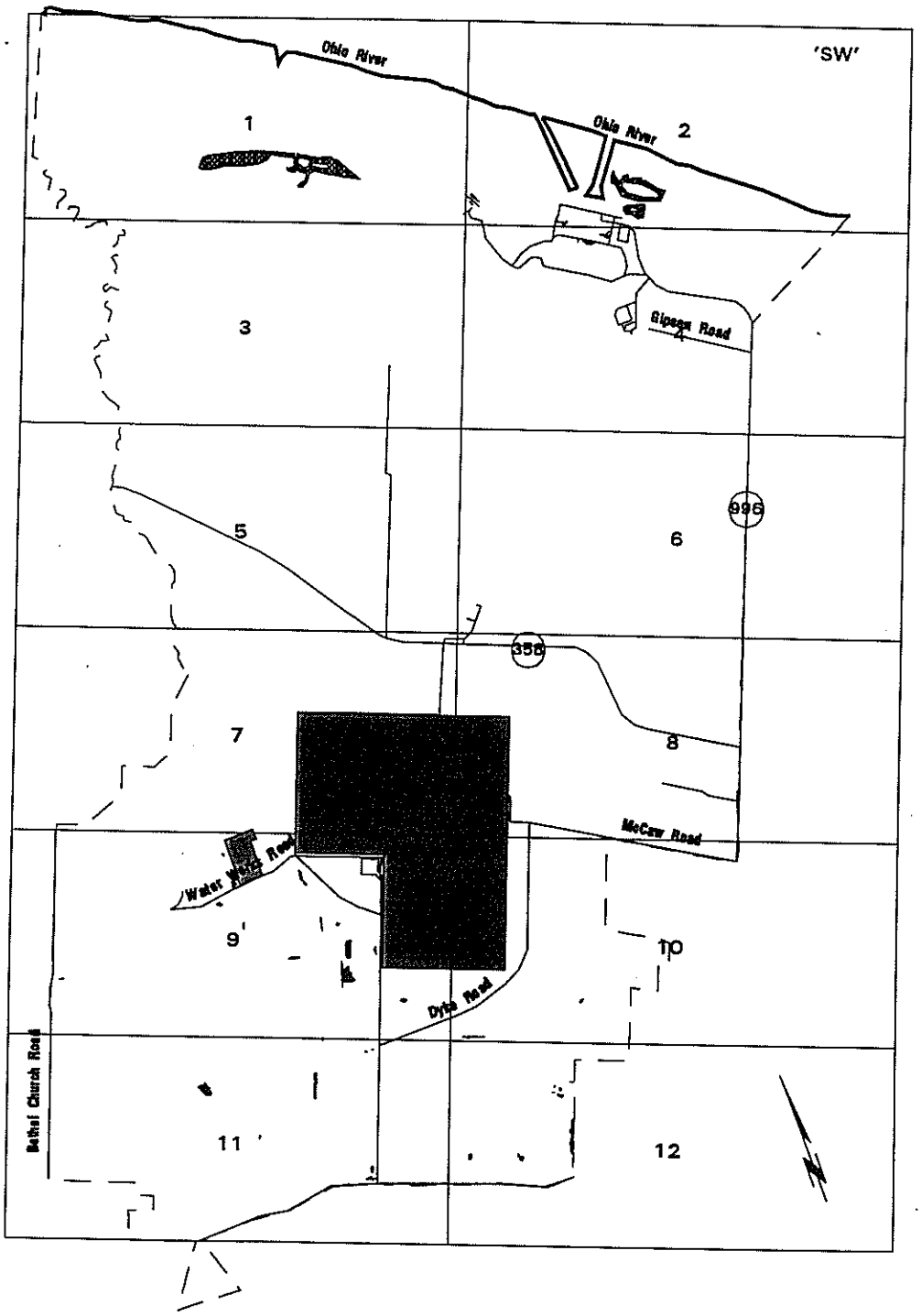
C.4
Distribution of Cover Type
Flood Plain-Oak (FP-O)

Photo 4
Cover Type: Flood Plain-Oak (FP-O)
Bayou Ridge Natural Area



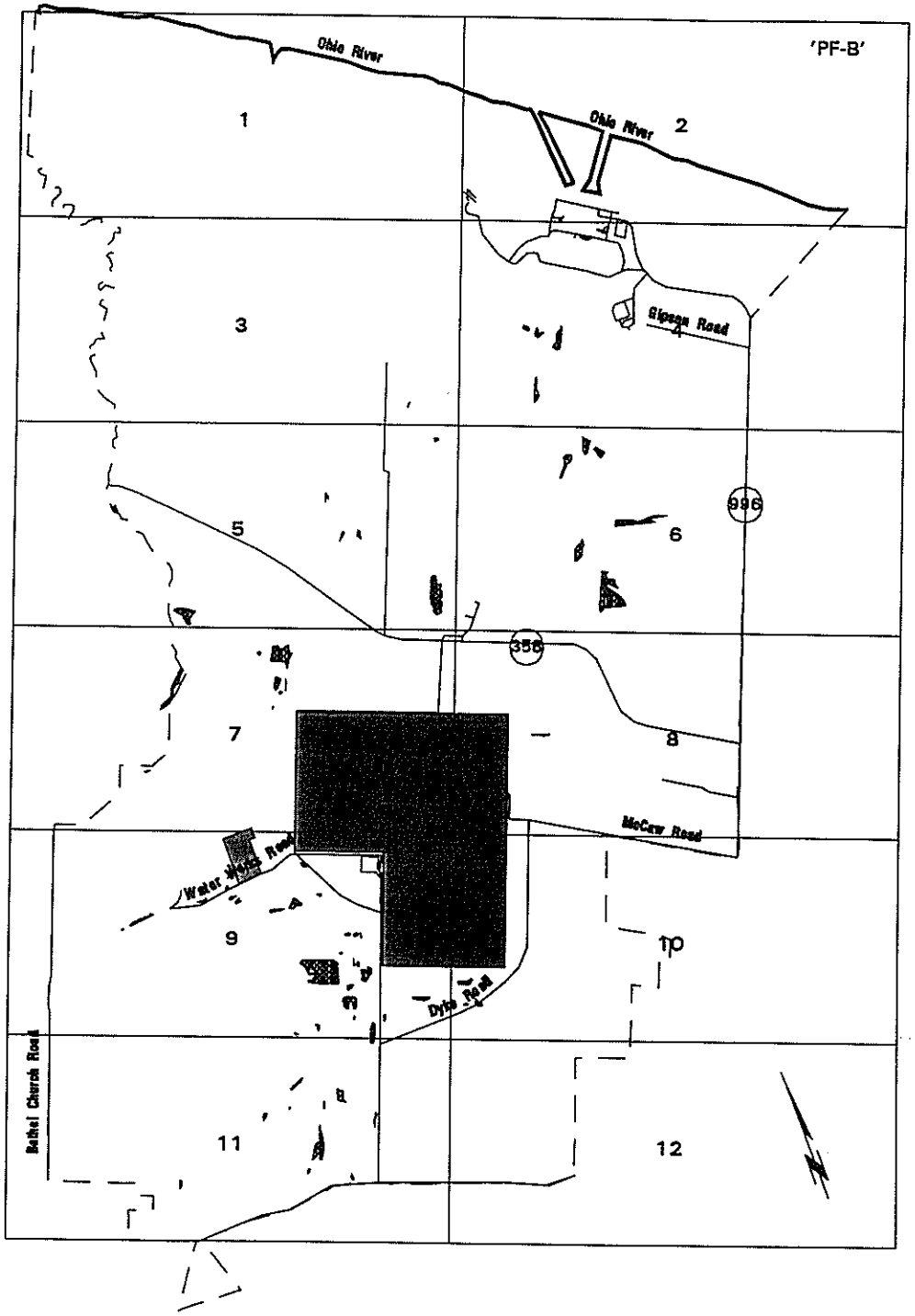
C.5
Distribution of Cover Type
Flood Plain-Tupelo (FP-T)

Photo 5
Cover Type: Flood Plain-Tupelo (FP-T)
Sample Point 63



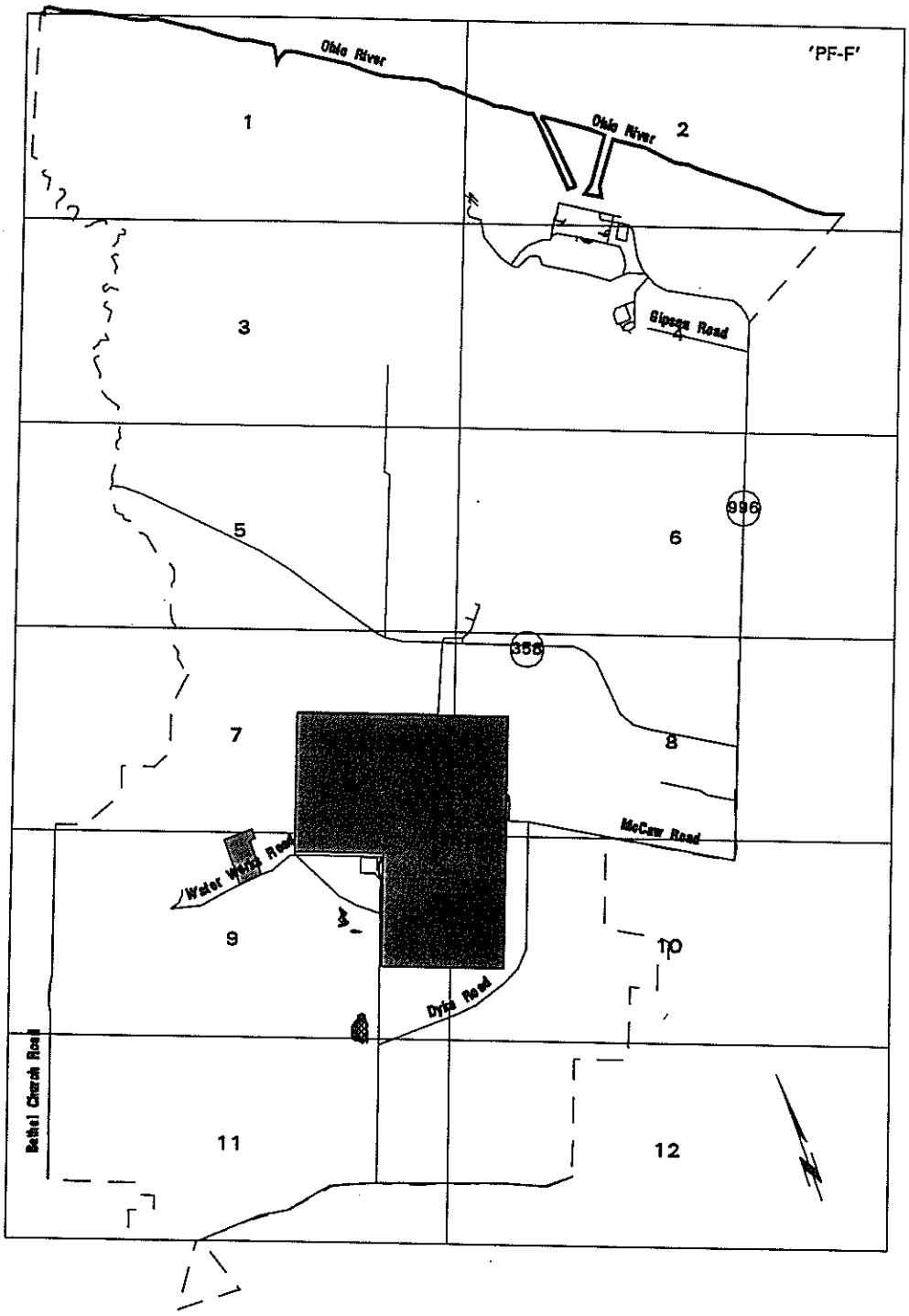
C.6
Distribution of Cover Type
Swamp (SW)

Photo 6
Cover Type: Swamp (SW)
Sample Point 62



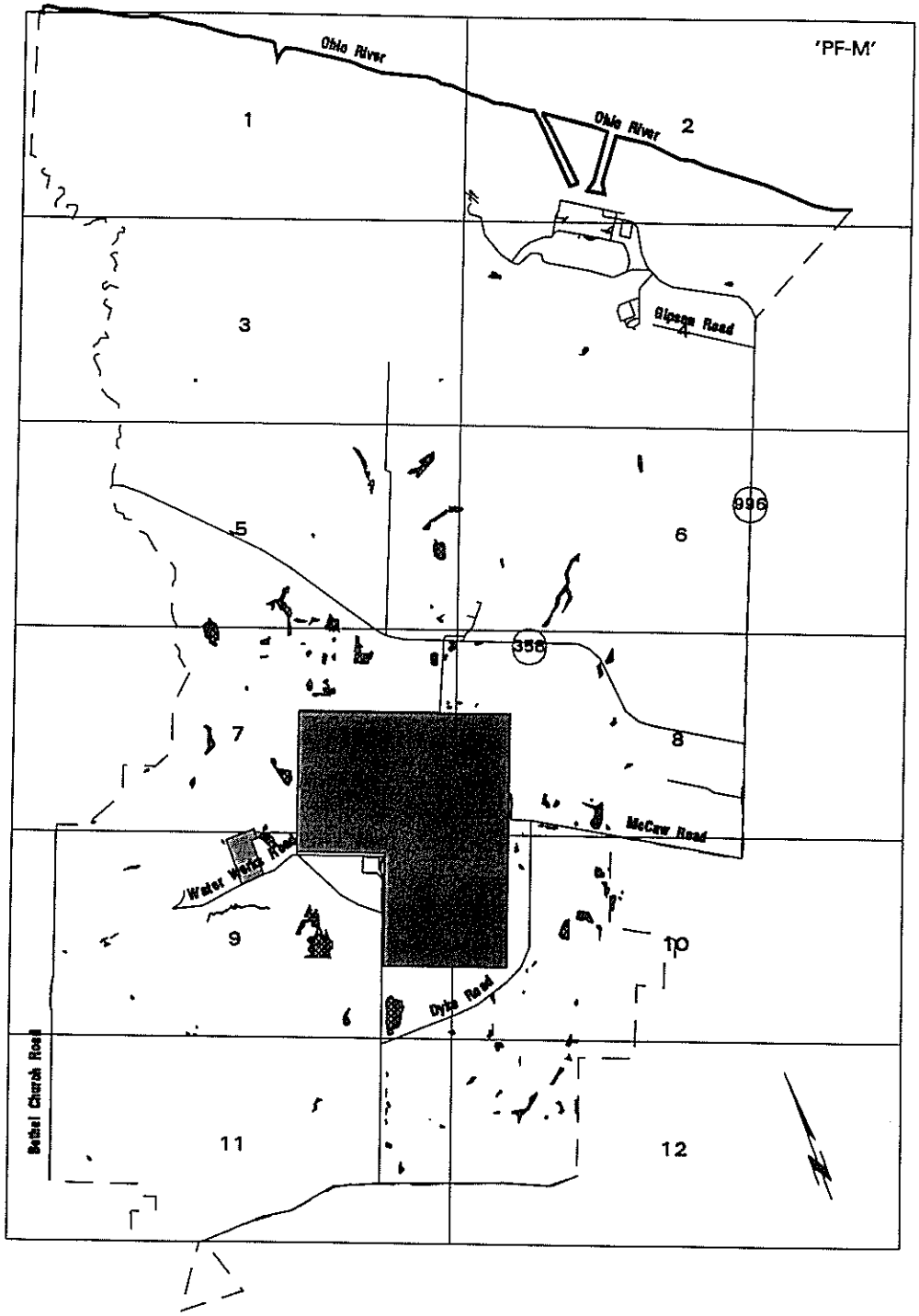
C.7
Distribution of Cover Type
Plain Forest-Birch (PF-B)

Photo 7
Cover Type: Plain Forest-Birch (PF-B)
Sample Point 11



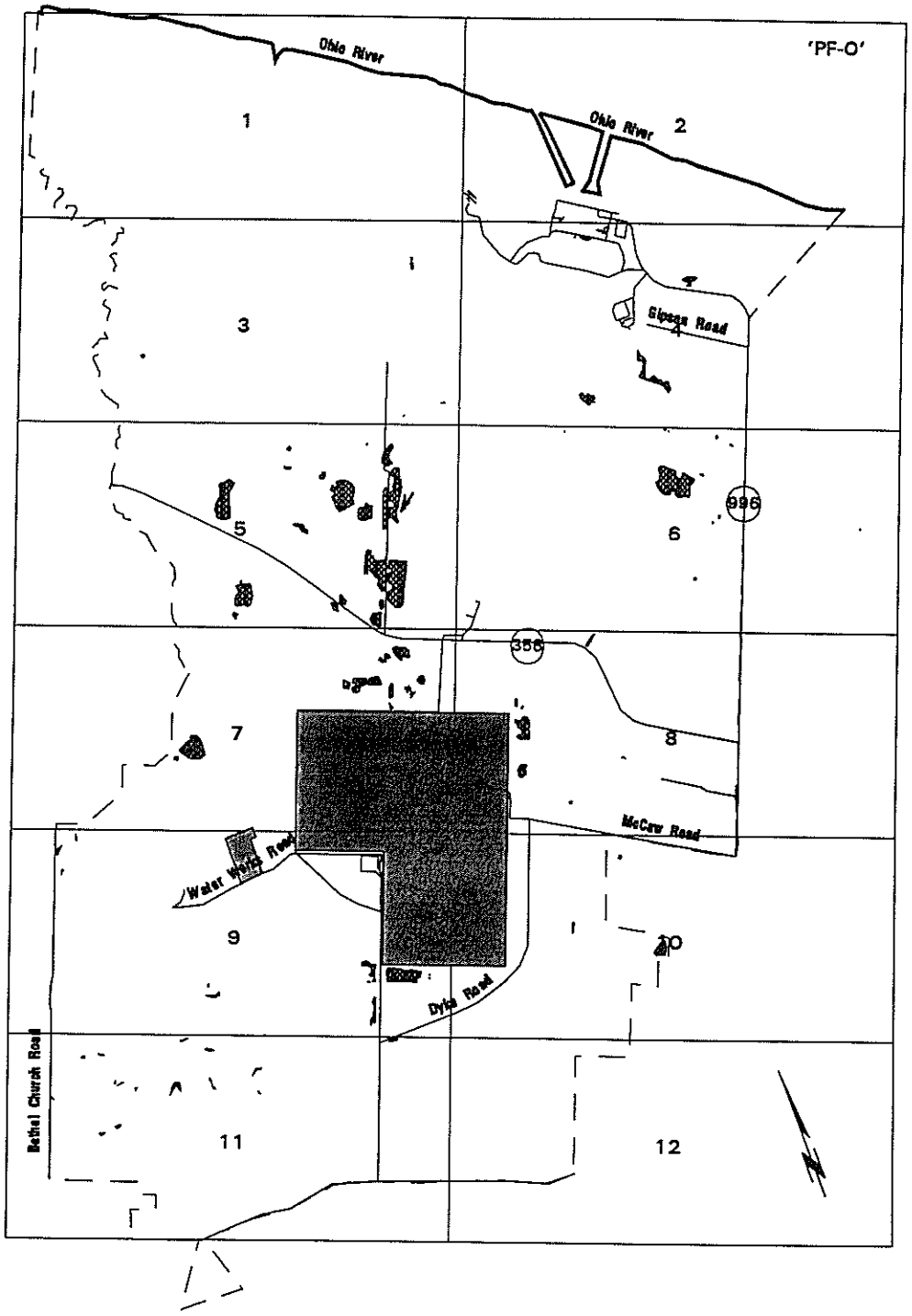
C.8
Distribution of Cover Type
Plain Forest-Farmed (PF-F)

Photo 8
Cover Type: Plain Forest-Farmed (PF-F)
Sample Point 24



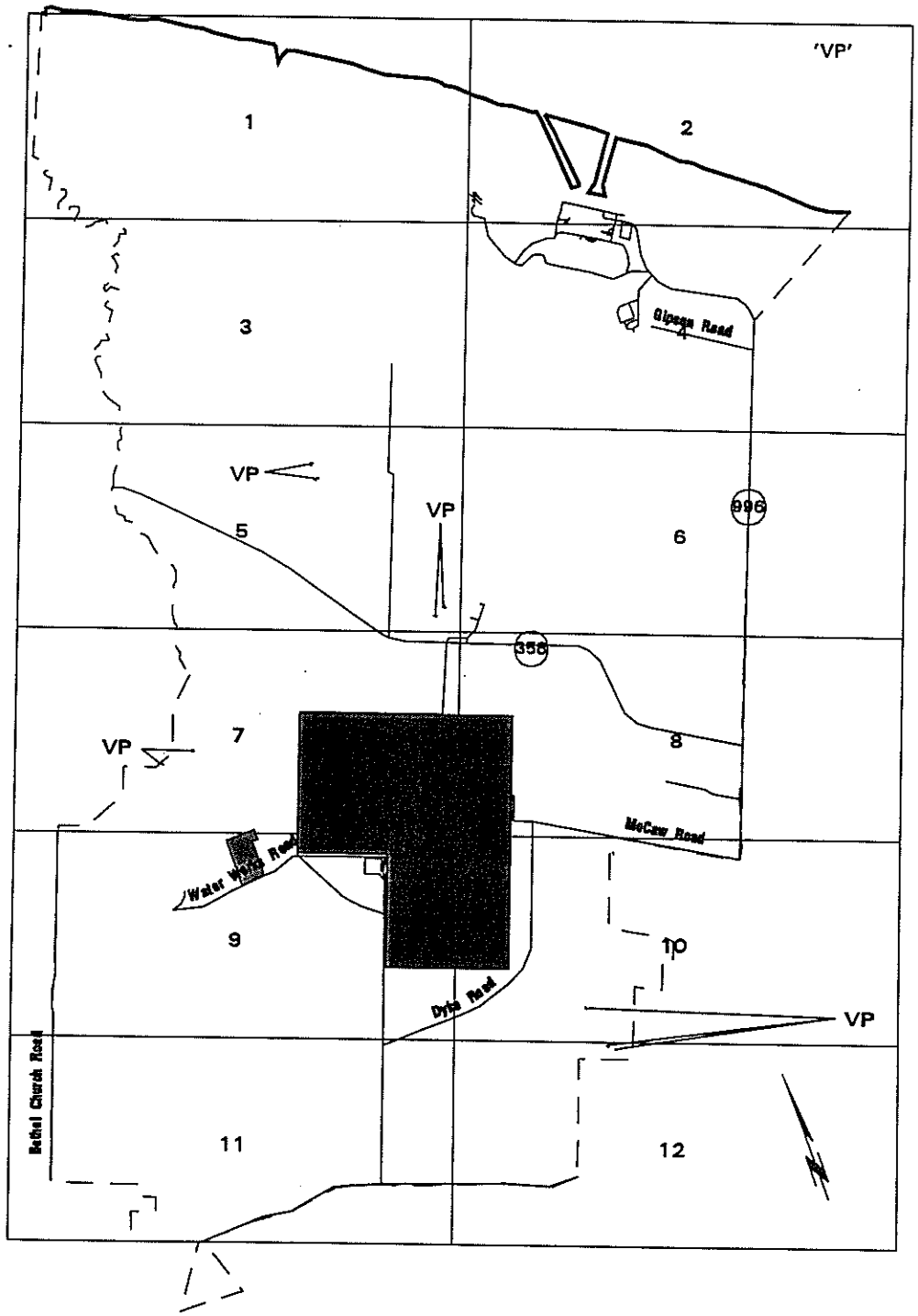
C.9
Distribution of Cover Type
Plain Forest-Maple (PF-M)

Photo 9
Cover Type: Plain Forest-Maple (PF-M)
Sample Point 22



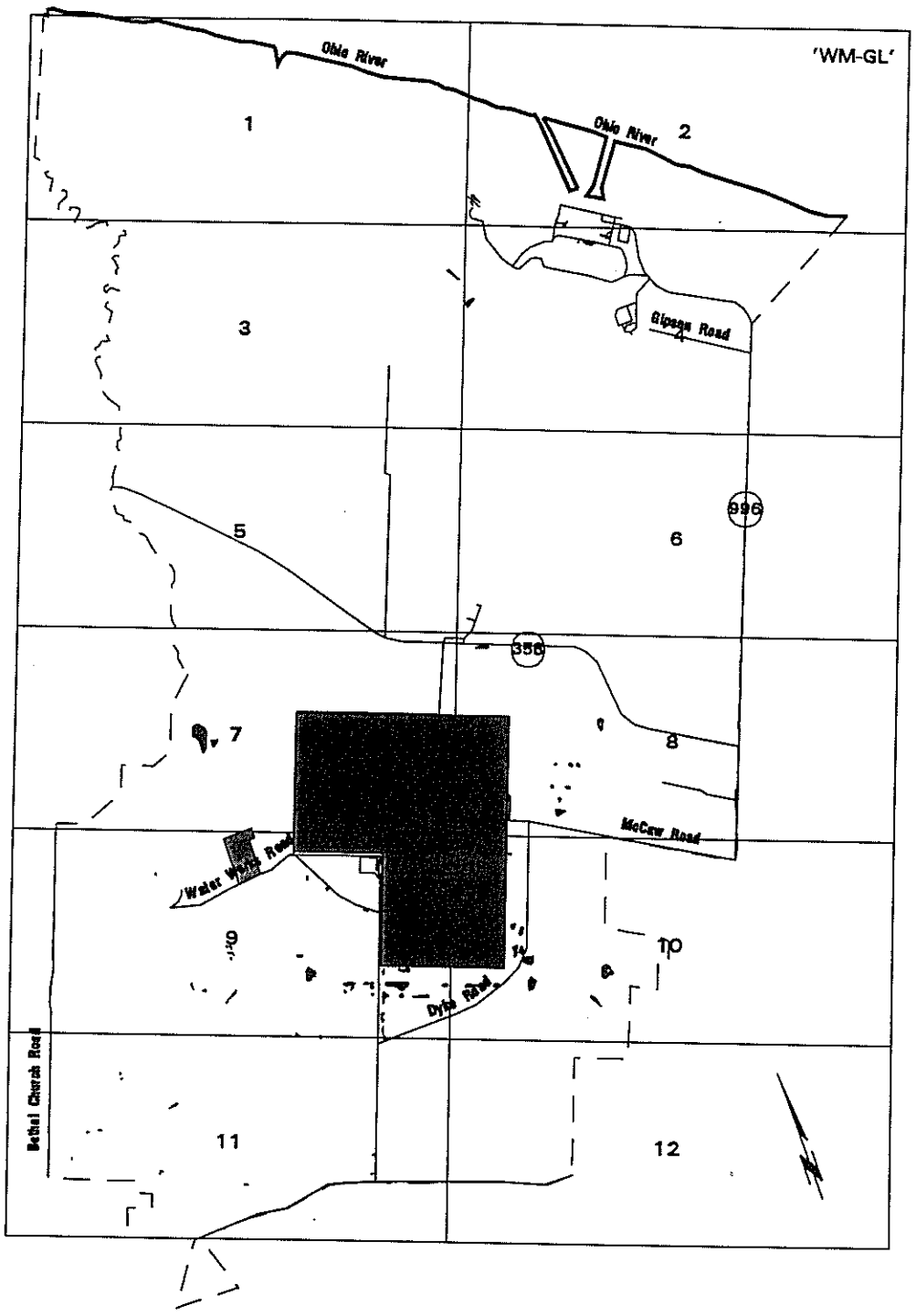
C.10
Distribution of Cover Type
Plain Forest-Oak (PF-O)

Photo 10
Cover Type: Plain Forest-Oak (PF-O)
Sample Point 26



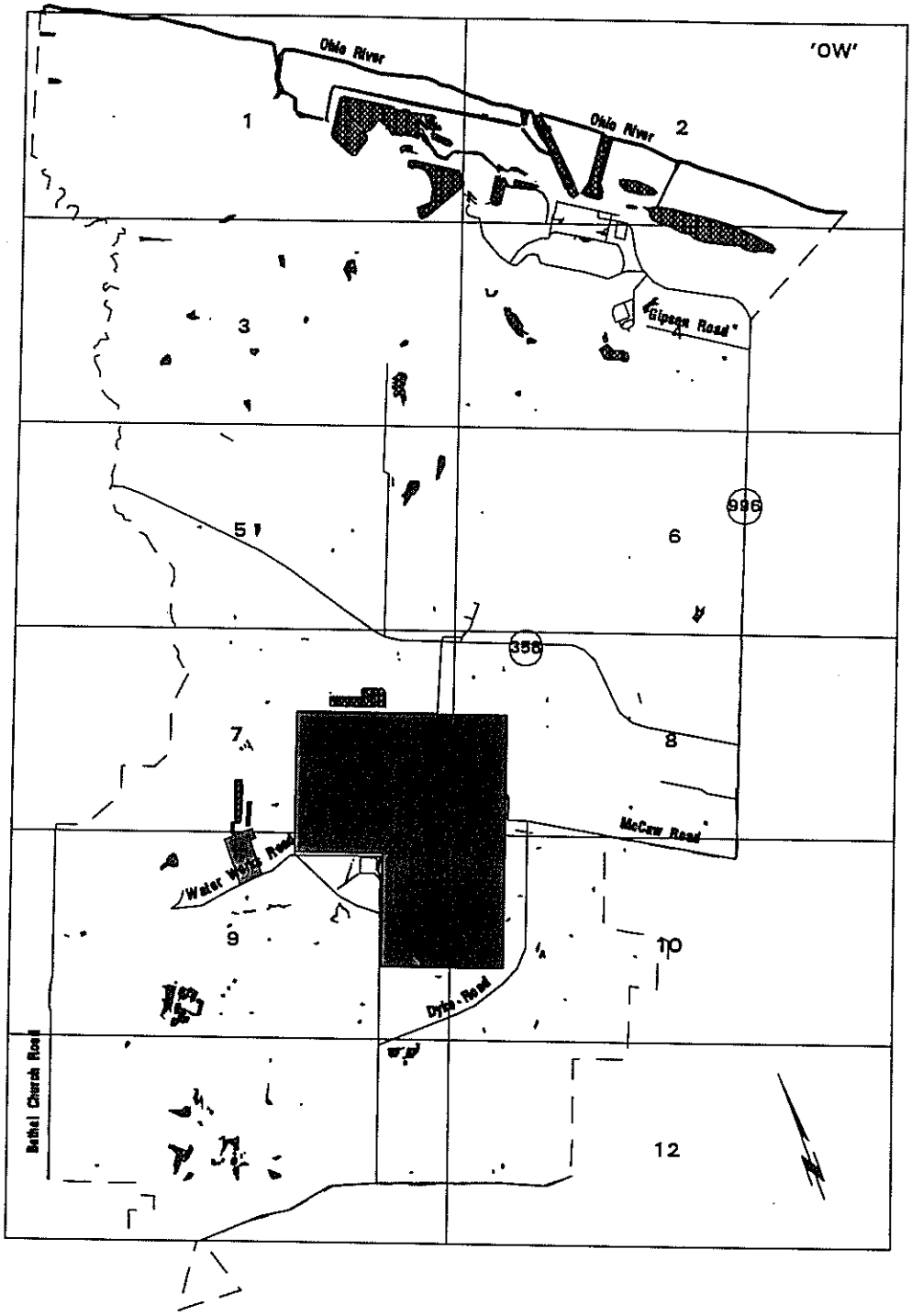
C.11
Distribution of Cover Type
Vernal Pool (VP)

Photo 11
Cover Type: Vernal Pool (VP)
Sample Point 6



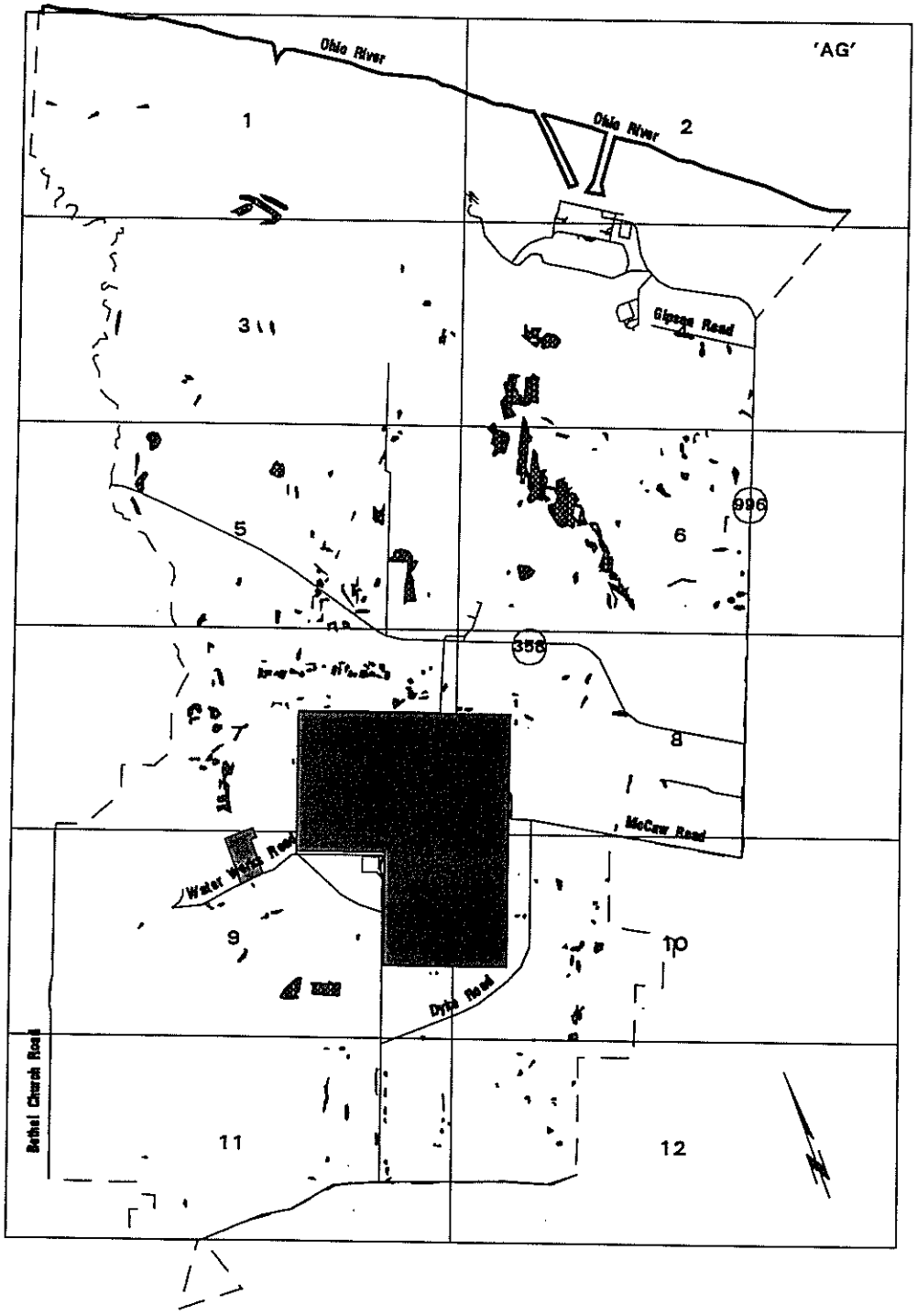
C.12
Distribution of Cover Type
Wet Meadow/Grassland (WM/GL)

Photo 12
Cover Type: Wet Meadow/Grassland (WM/GL)
Sample Point 64



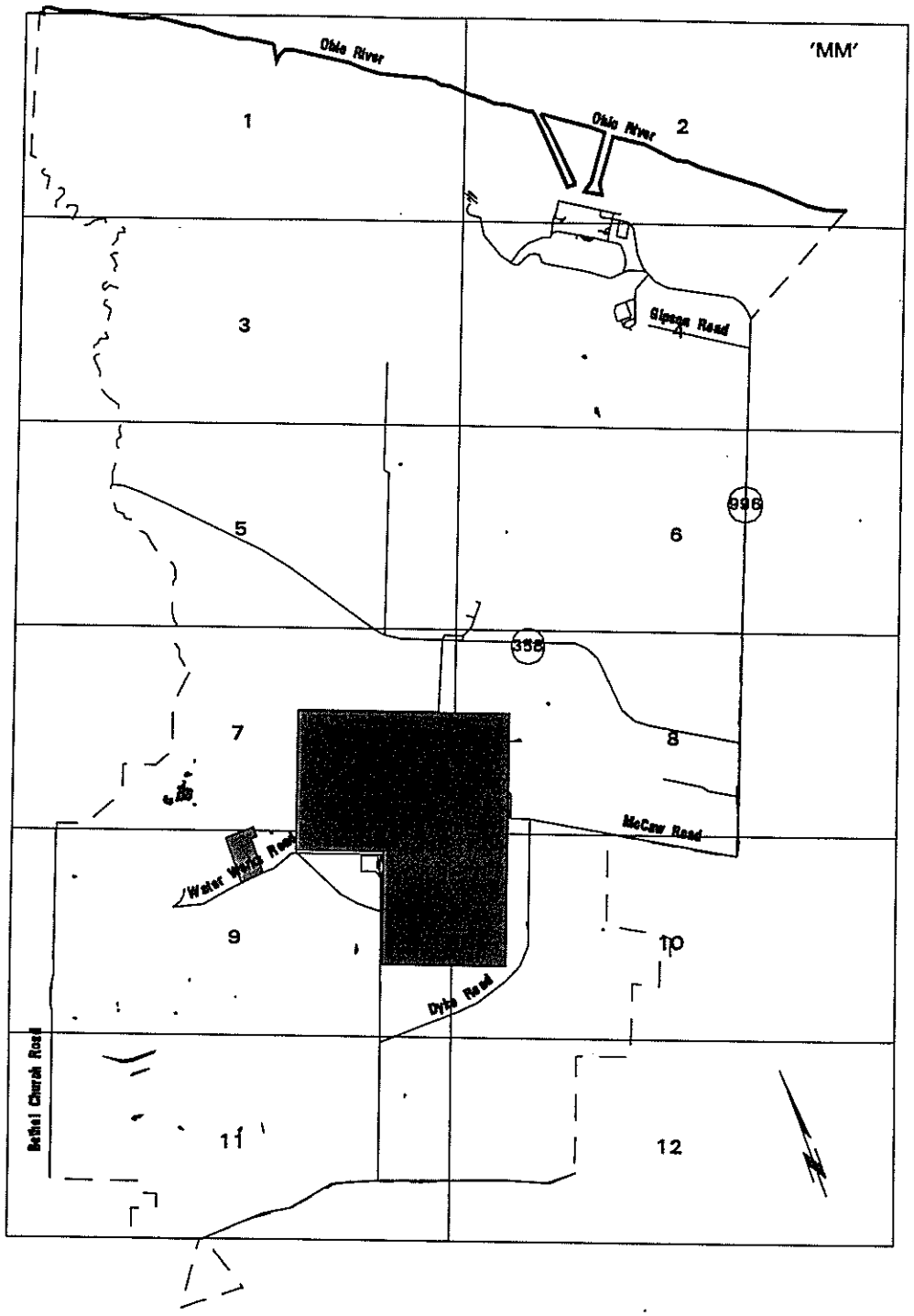
C.13
Distribution of Cover Type
Open Water (OW)

Photo 13
Cover Type: Open Water (OW)
Sample Point 16



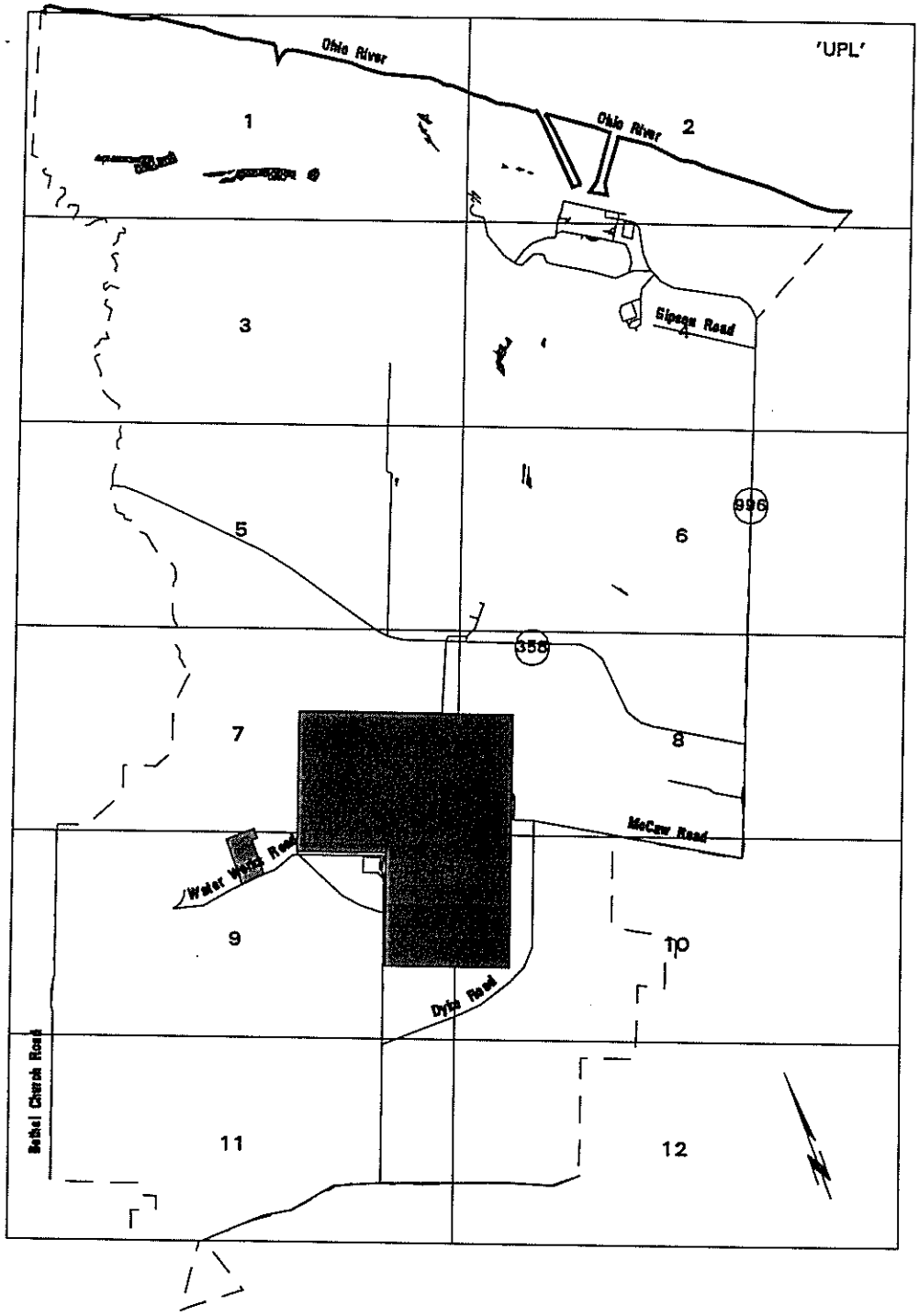
C.14
Distribution of Cover Type
Agricultural (AG)

Photo 14
Cover Type: Agricultural (AG)
Sample Point 3



C.15
Distribution of Cover Type
Man Made (MM)

Photo 15
Cover Type: Man Made (MM)
Sample Point 25



C.16
Distribution of
Mature Second Growth - Upland

Photo 16
Mature Second Growth - Upland

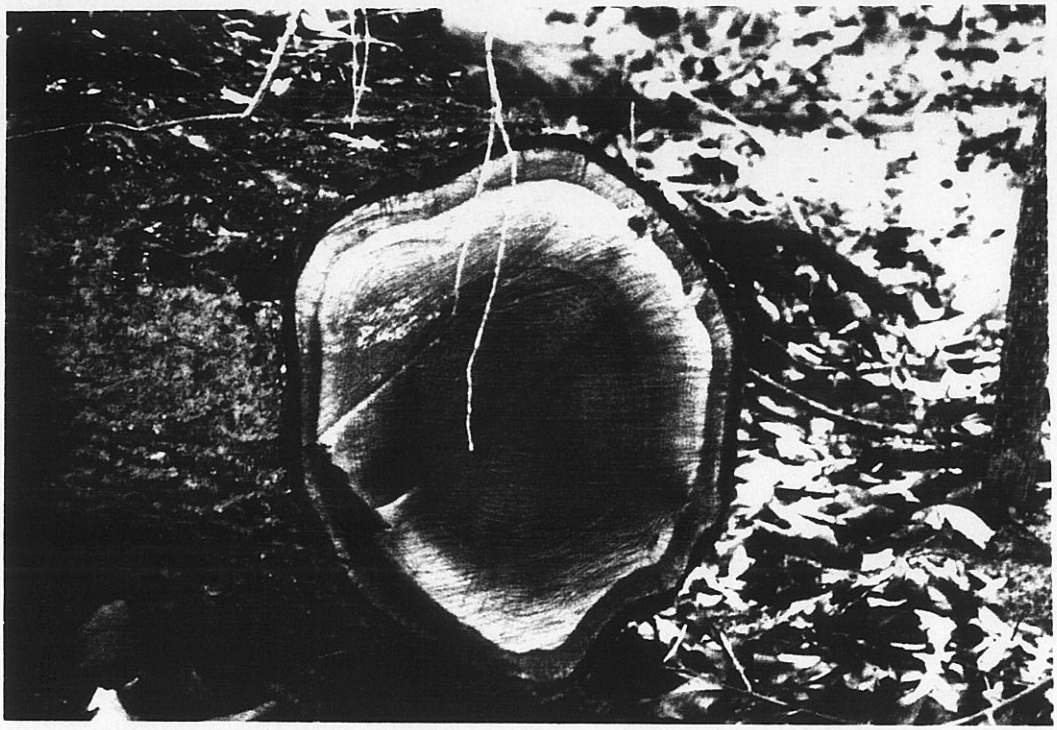
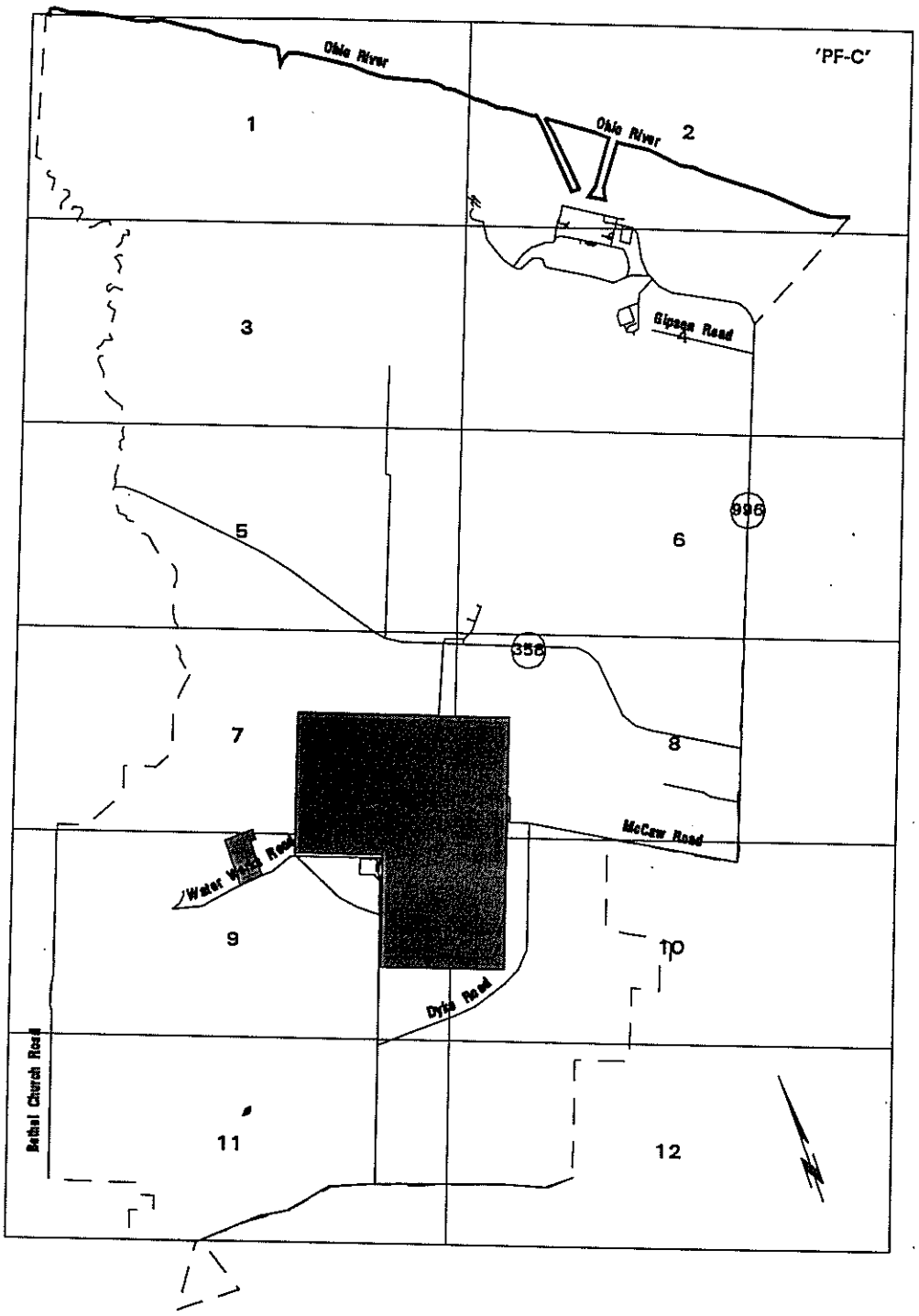


Photo 17
Mature Second Growth - Wetland
Approximate Age 95+ years
Sample Point 19



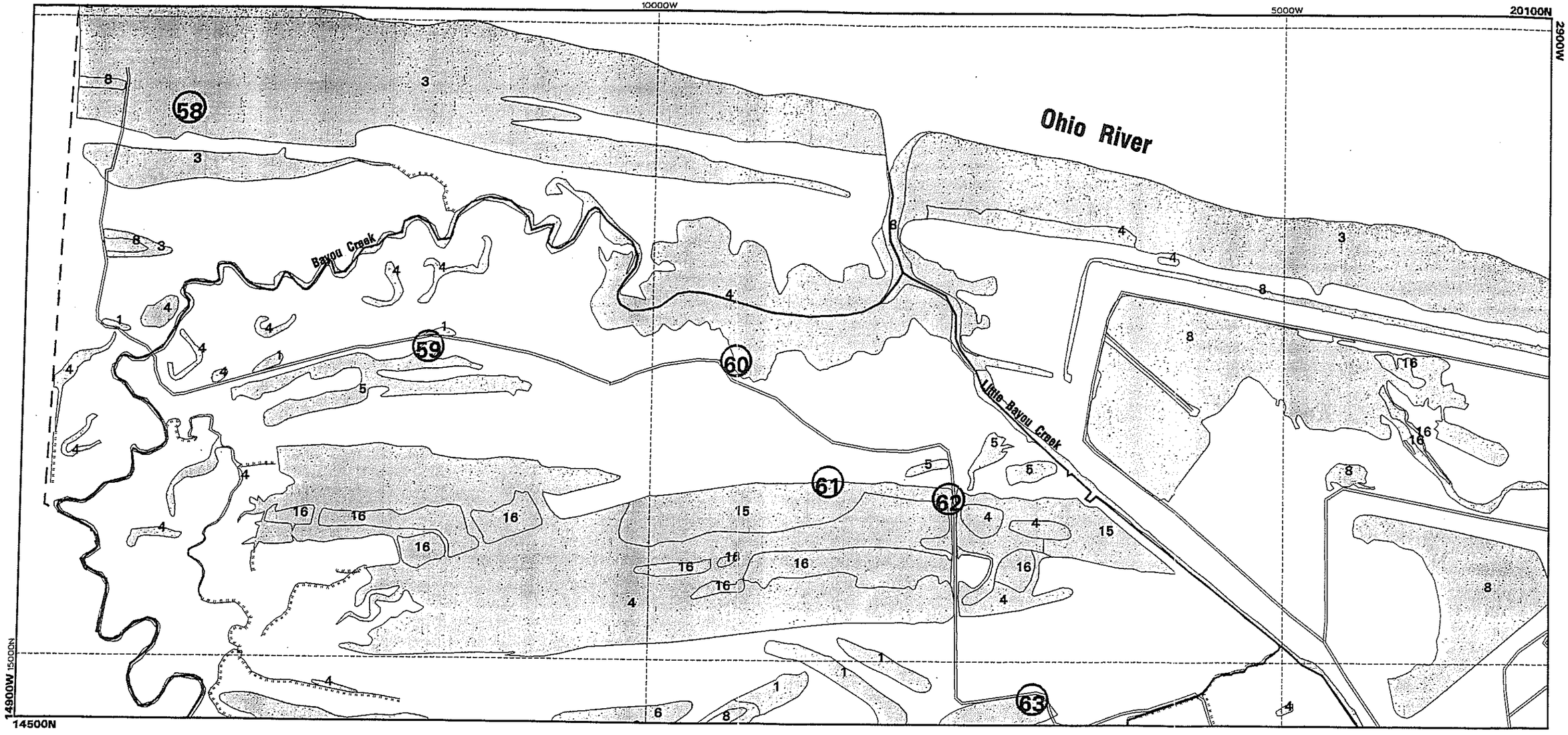
C.18
Distribution of Cover Type
Plain Forest-Cottonwood (PF-C)

NO PHOTOGRAPH AVAILABLE

FOR

PLAIN FOREST-COTTONWOOD (PF-C)

Appendix D
Wetlands Baseline Map



- Paved Roads
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- Fenced Area

Wetlands Investigation

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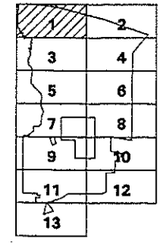
500 0 500 1000 1500

FEET

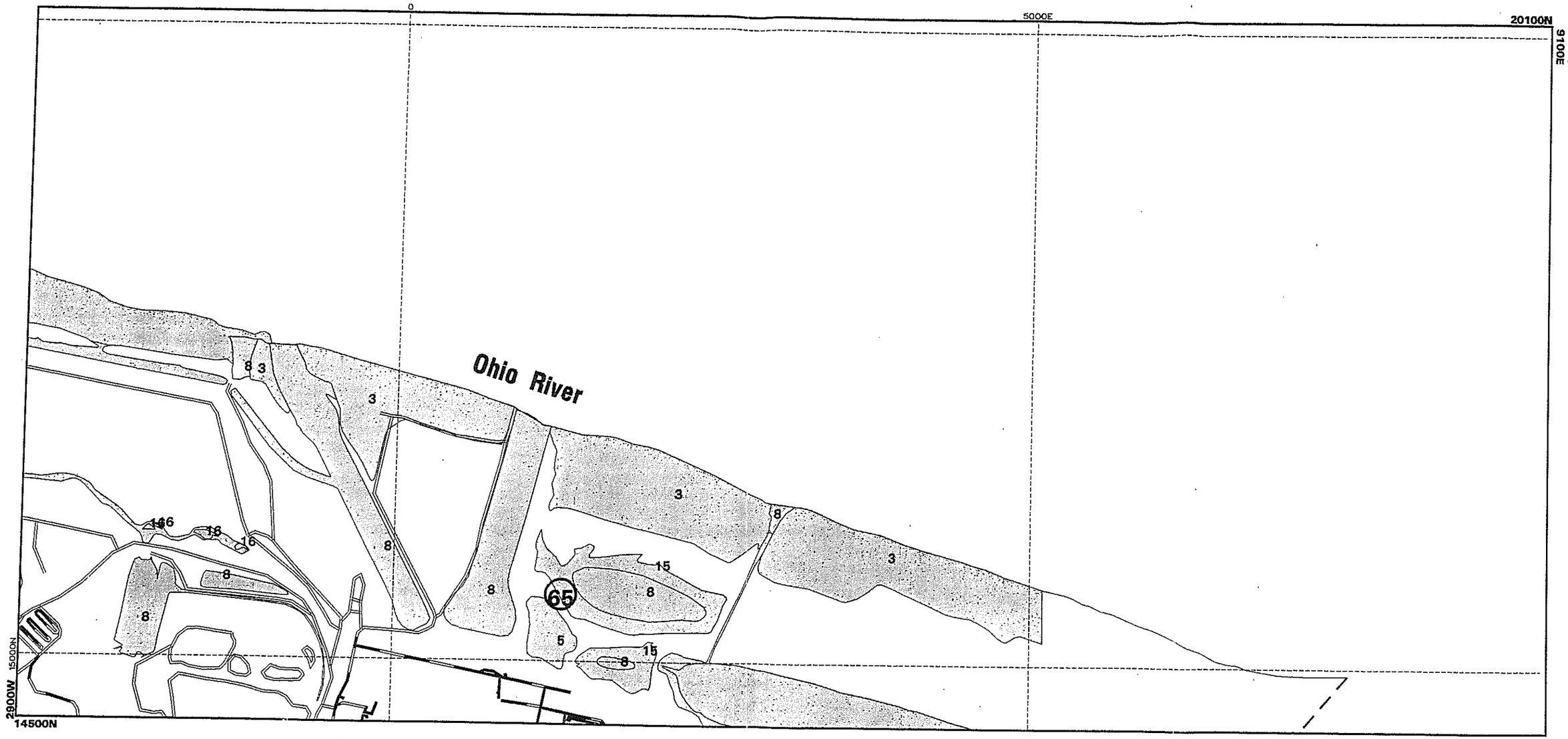
Paducah Gaseous Diffusion Plant

Environmental Investigation

PGDP Local Coordinates (Feet)



Sheet 1 of 13



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FEET

Paducah Gaseous Diffusion Plant

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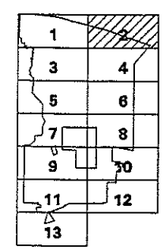
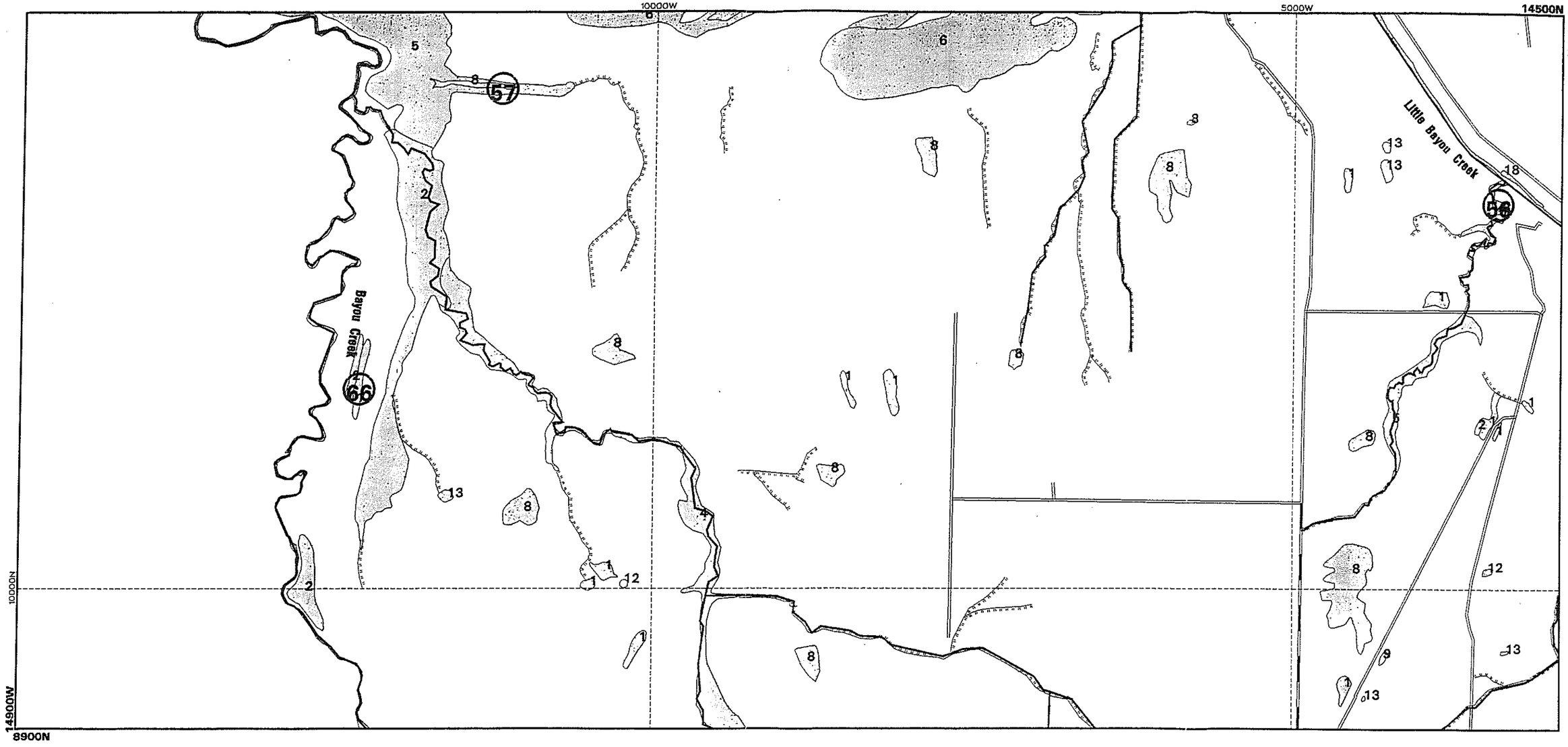
PGDP Local Coordinates (Feet)





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FEET

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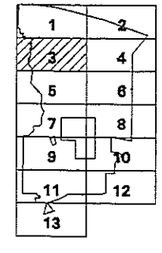
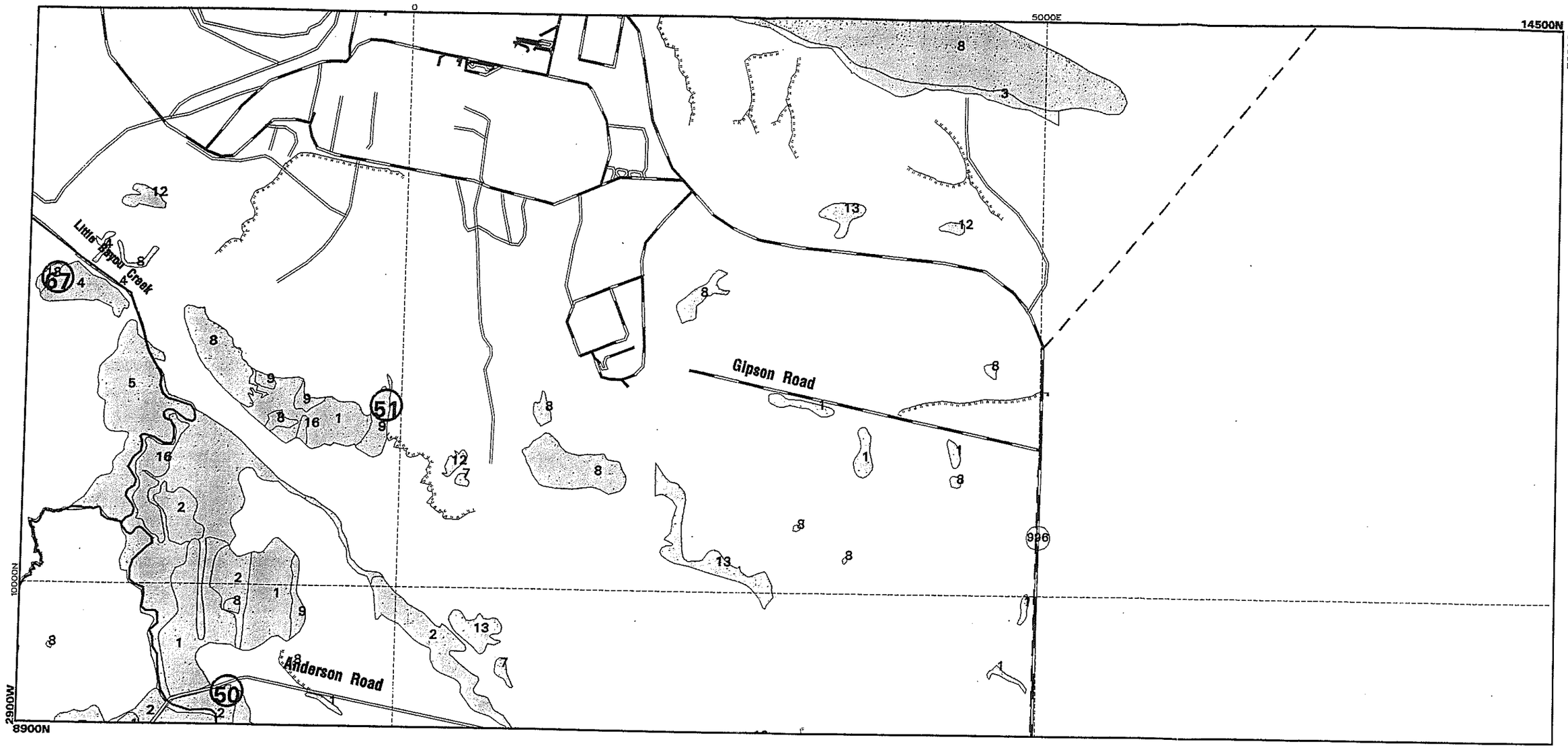


Sheet 3 of 13



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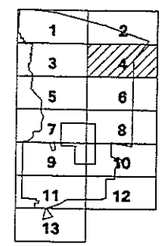

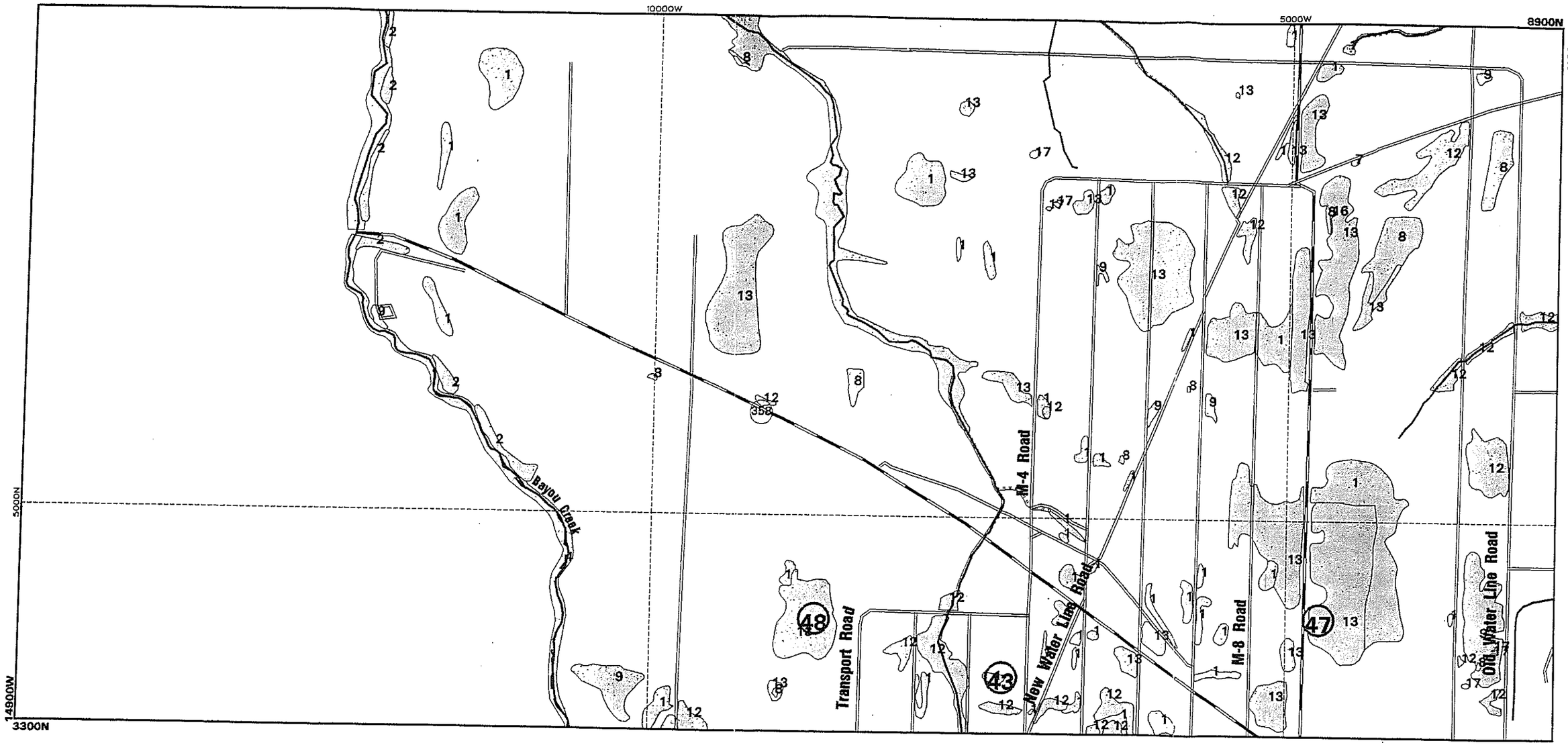

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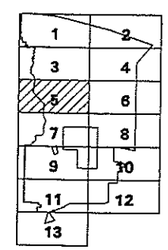

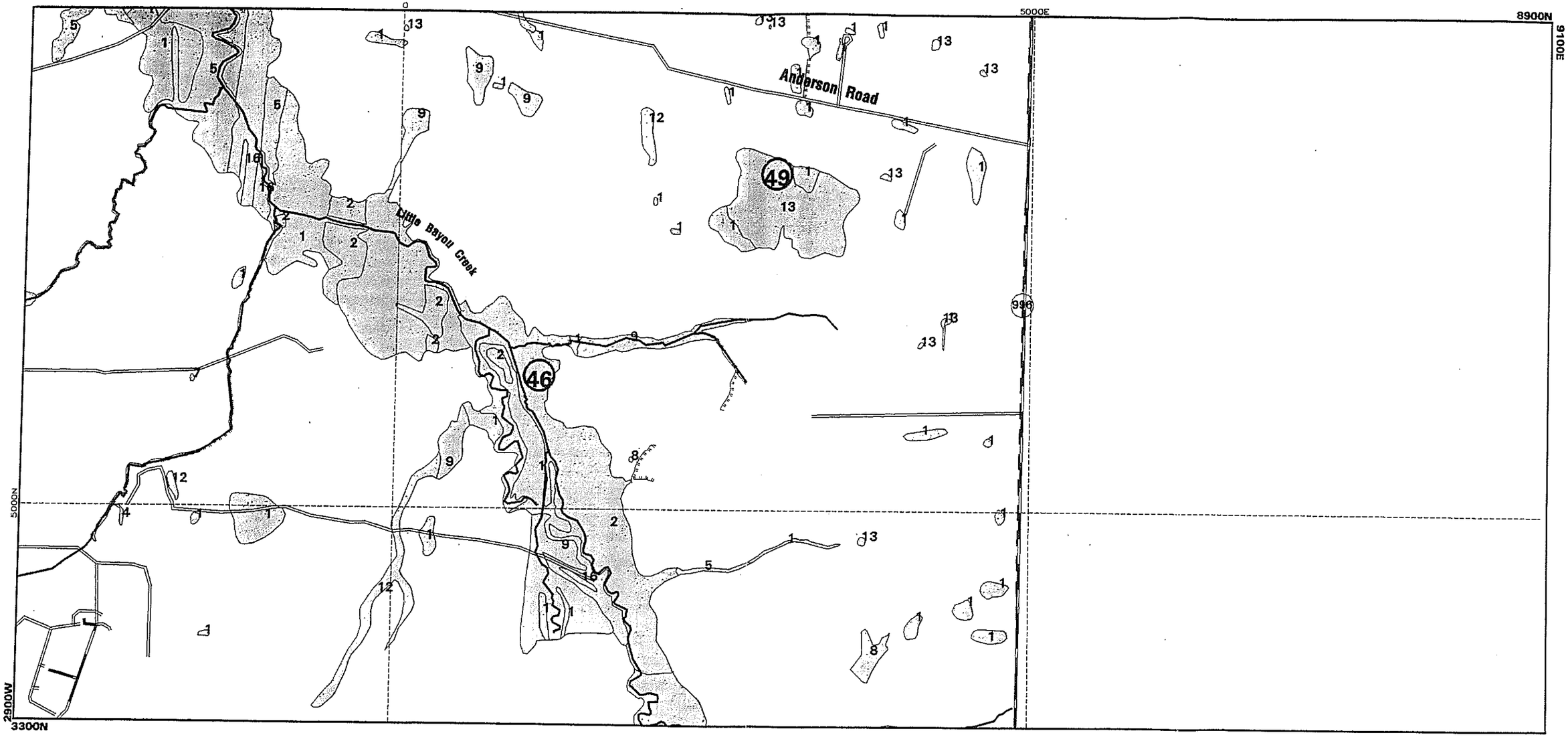

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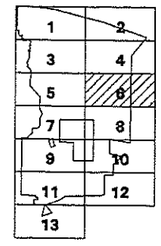

10000W

5000W

3300N

2900W

14900W

2300S

Bayou Creek

Transport Road

New Water Line Road

M-4 Road

West Boone Road

40

41

42

44

45

39

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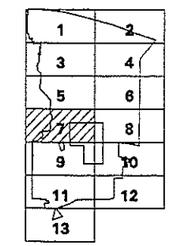
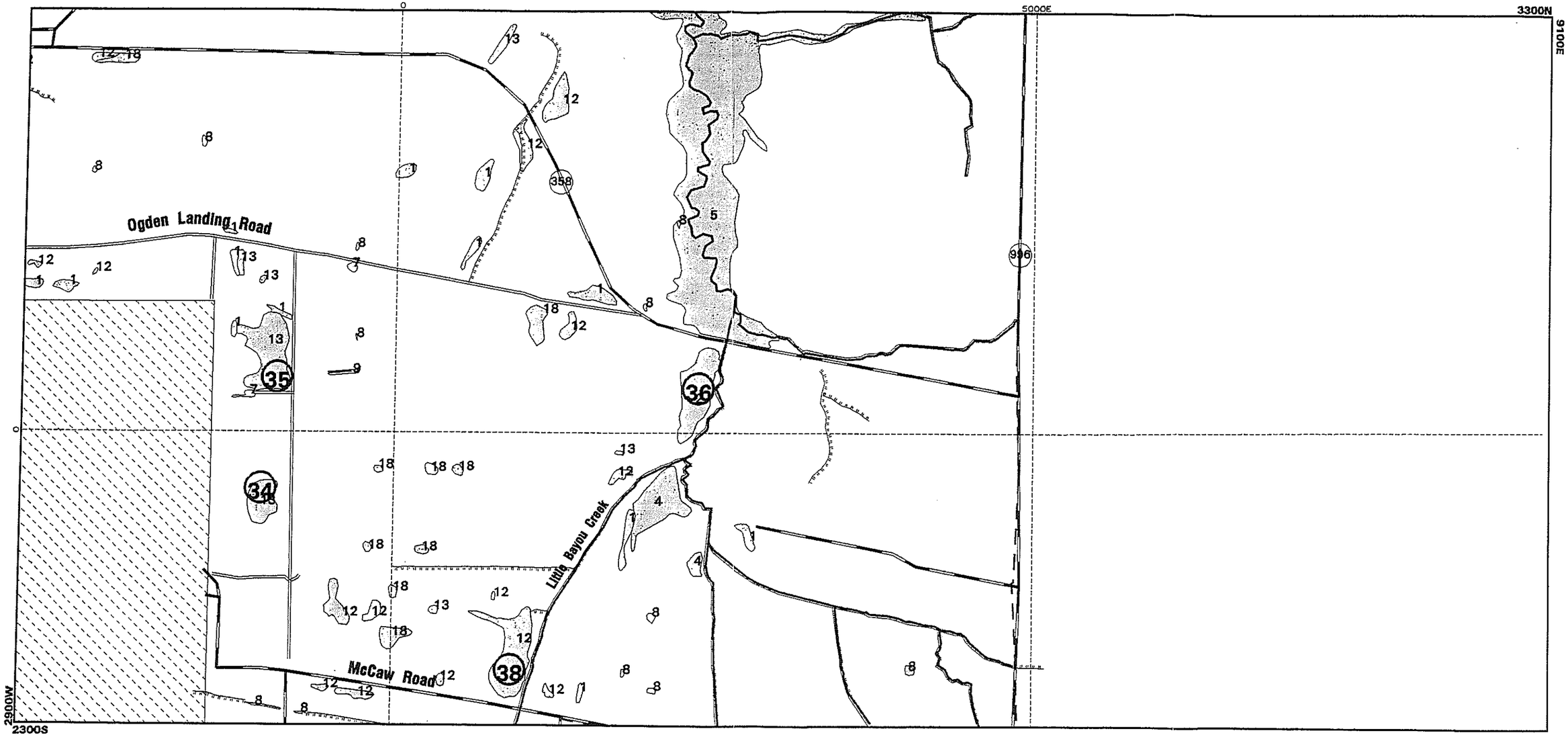


Sheet 7 of 13



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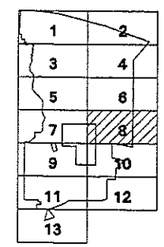
Environmental Investigation
PGDP Local Coordinates (Feet)



10000W

5000W

7900S

14900W

5000S

2800W

2300S

Bethel Church Road

Water Works Road

Curlee Road

Transport Road

Dyke Road

Bear Creek

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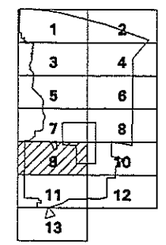

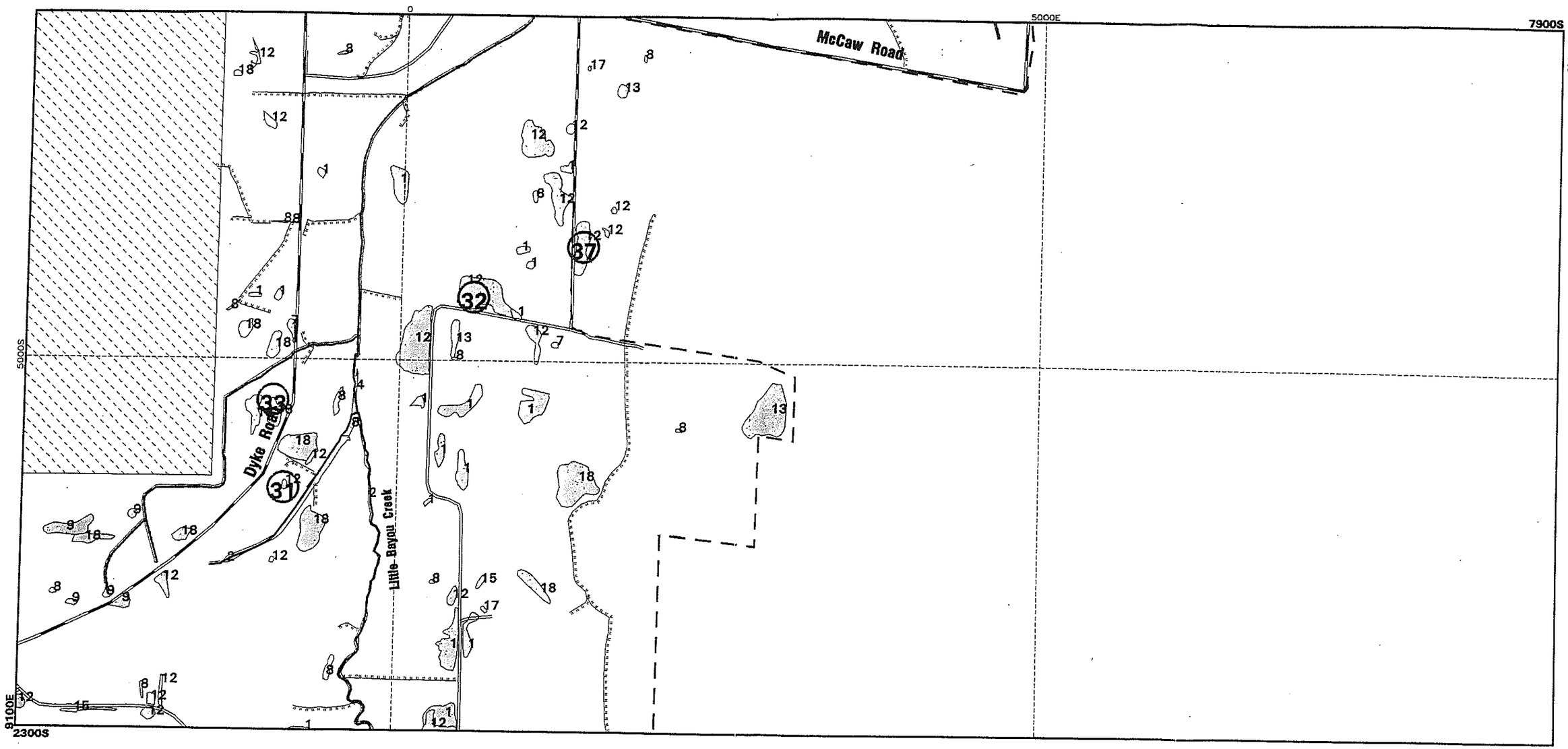

Paved Roads

Gravel/Dirt Roads

PGDP Boundary

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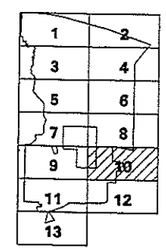

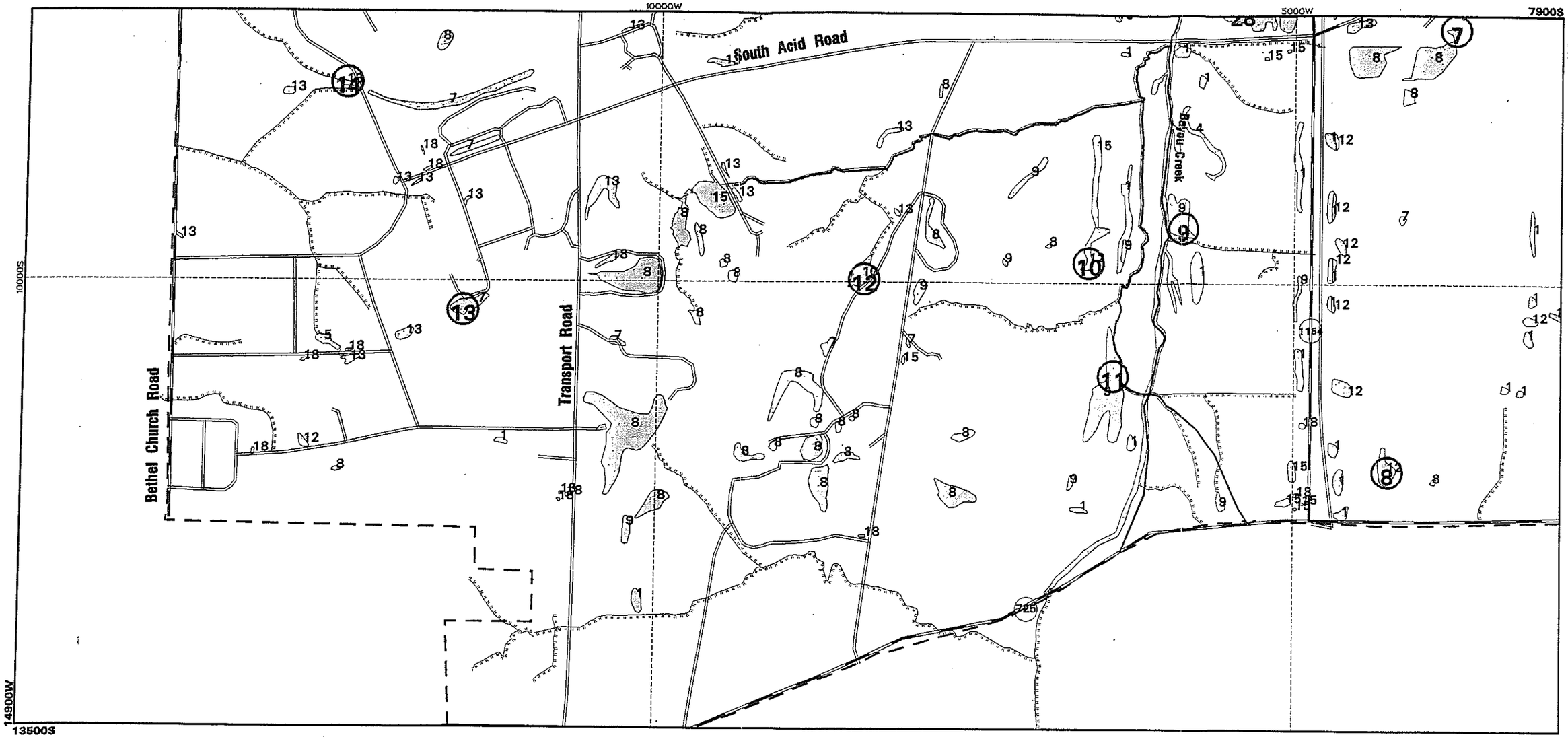

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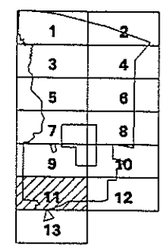

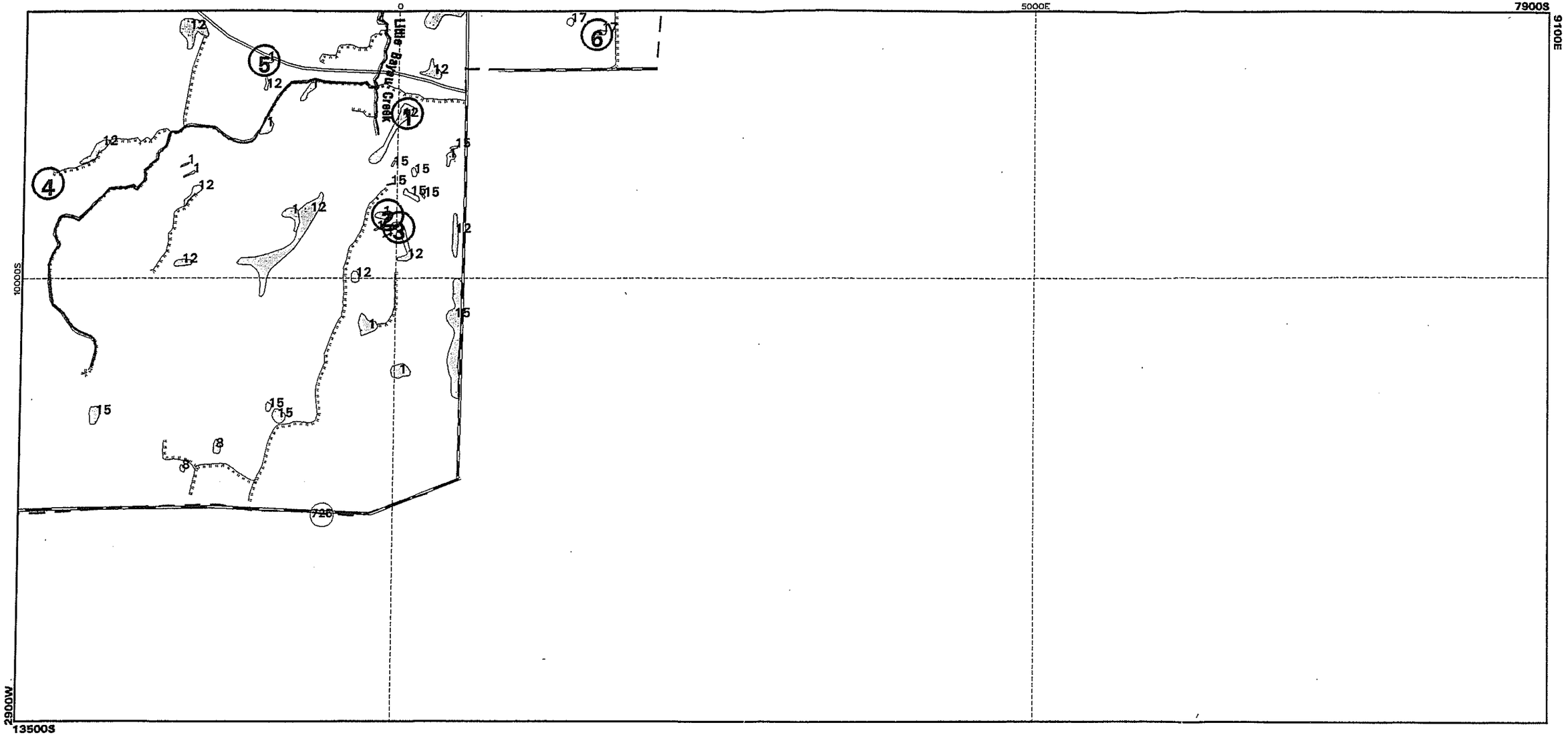

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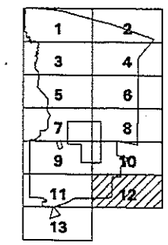

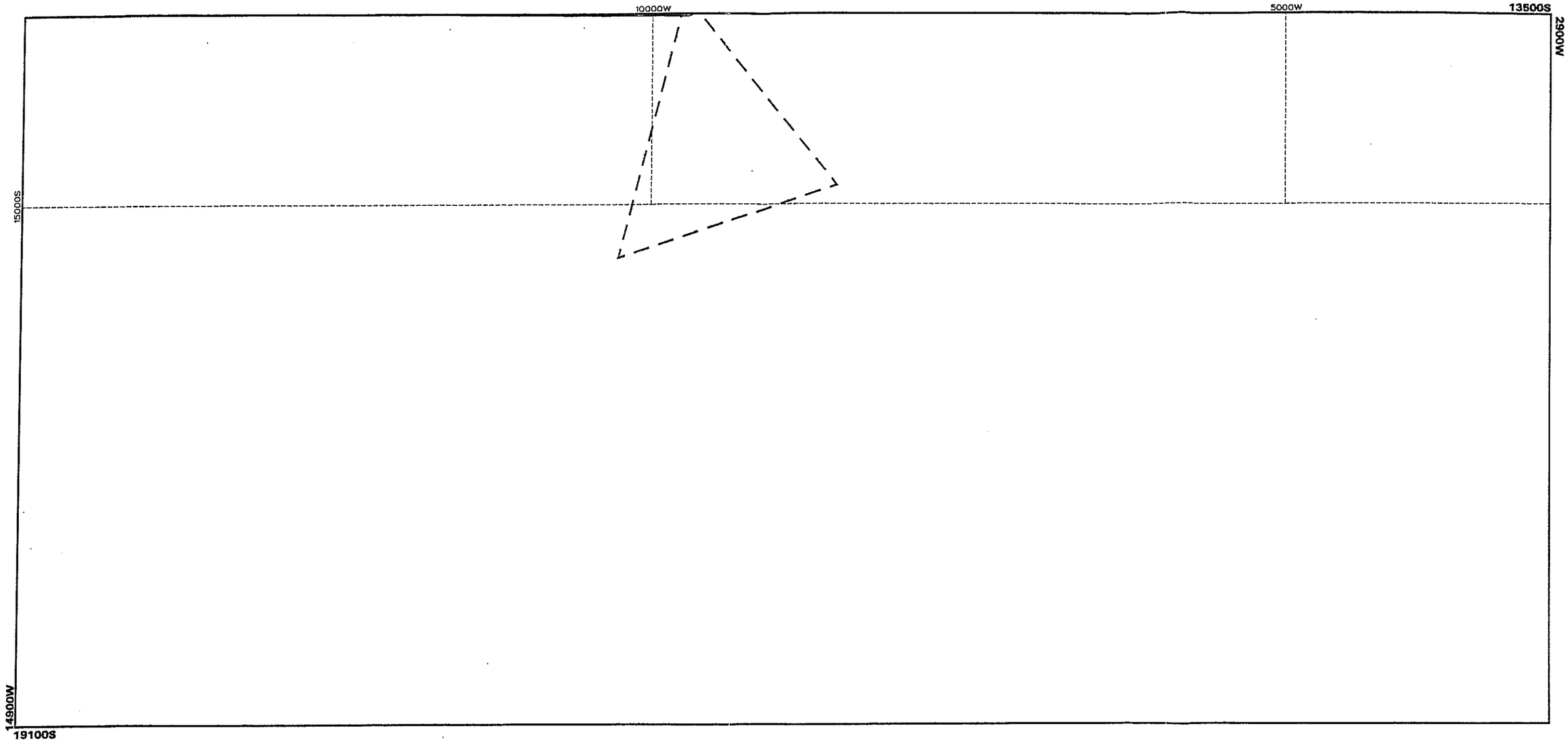

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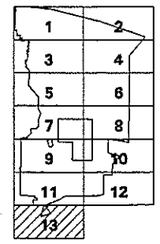

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