GOLDEN TRIANGLE II SOLAR FACILITY and BATTERY ENERGY STORAGE SYSTEM PROJECT

Lowndes County, Mississippi

DRAFT ENVIRONMENTAL ASSESSMENT

Prepared for:
TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

Submitted By:
MS Solar 6, LLC

Prepared by:
Burns & McDonnell

February 2022

To request further information, contact:
J. Taylor Johnson
NEPA Compliance
Tennessee Valley Authority
1101 Market Street, BR 2C-C
Chattanooga, Tennessee 37402
E-mail: jtcates@tva.gov

Page No.

1.0 INTRODUCTION 1-1
1.1 Purpose and Need for Action 1-1
1.2 Scope of this Environmental Assessment 1-2
1.3 Public Involvement 1-1
1.4 Necessary Permits or Licenses 1-1
1.4.1 Clean Water Act and Rivers and Harbors Act 1-2
1.4.2 Endangered Species Act of 1973 1-3
1.4.3 National Historic Preservation Act 1-3
1.4.4 Mississippi Natural Heritage Program 1-3
1.4.5 Mississippi Department of Environmental Quality 1-4
1.4.6 County and Municipality Permitting 1-4

2.0 DESCRIPTION OF PROPOSED ALTERNATIVES 2-1
2.1 No Action Alternative 2-1
2.2 Proposed Action Alternative 2-1
2.2.1 Project Description 2-1
2.2.2 Solar Facility Construction 2-2
2.2.3 Operations 2-4
2.2.4 Decommissioning and Reclamation 2-5
2.3 Alternatives Eliminated from Further Consideration 2-5
2.4 Comparison of Alternatives 2-6
2.5 Best Management Practices and Mitigation Measures 2-9
2.5.1 Golden Triangle II Solar Facility 2-9
2.6 The Preferred Alternative 2-10

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 3-1
3.1 Land Use 3-1
3.1.1 Affected Environment 3-1
3.1.2 Environmental Consequences 3-1
3.2 Geology, Soils, and Prime Farmland 3-1
3.2.1 Affected Environment 3-1
3.2.2 Environmental Consequences 3-1
3.3 Water Resources 3-3
3.3.1 Affected Environment 3-3
3.3.2 Environmental Consequences 3-1
3.4 Biological Resources 3-2
3.4.1 Affected Environment 3-3
3.4.2 Environmental Consequences – Biological Resources 3-8
3.5 Visual Resources 3-12
3.5.1 Affected Environment 3-12
3.5.2 Environmental Consequences 3-15
3.6 Noise 3-17
3.6.1 Affected Environment 3-18
3.6.2 Environmental Consequences - Noise 3-19

3.7 Air Quality and Greenhouse Gas Emissions 3-19
3.7.1 Affected Environment 3-19
3.7.2 Environmental Consequences 3-22
3.8 Cultural Resources 3-24
3.8.1 Affected Environment 3-25
3.8.2 Environmental Consequences - Cultural 3-28
3.9 Utilities 3-31
3.9.1 Affected Environment 3-31
3.9.2 Environmental Consequences - Utilities 3-32
3.10 Waste Management 3-33
3.10.1 Affected Environment 3-33
3.10.2 Environmental Consequences 3-33
3.11 Public and Occupational Health and Safety 3-38
3.11.1 Affected Environment 3-39
3.11.2 Environmental Consequences 3-41
3.12 Socioeconomics 3-42
3.12.1 Affected Environment 3-42
3.12.2 Environmental Consequences 3-43
3.13 Environmental Justice 3-44
3.13.1 Affected Environment 3-44
3.13.2 Environmental Consequences 3-45
3.14 Transportation 3-46
3.14.1 Affected Environment 3-46
3.14.2 Environmental Consequences 3-46

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND CUMULATIVE IMPACTS 4-1
4.1 Unavoidable Adverse Environmental Impacts 4-1
4.2 Relationship of Short-Term Uses and Long-Term Productivity 4-3
4.3 Irreversible and Irretrievable Commitments of Resources 4-3
4.4 Cumulative Impacts 4-3
4.4.1 Federal Projects 4-4
4.4.2 State and Local Projects 4-2

5.0 LIST OF PREPARERS 5-1

6.0 LITERATURE CITED 6-1

APPENDIX A - TVA'S *SITE CLEARING AND GRADING SPECIFICATIONS*
APPENDIX B - WETLAND AND WATERBODY DELINEATION REPORT
APPENDIX C - ONSITE AND OFFSITE DRAINAGE REPORT
APPENDIX D - PROTECTED SPECIES INFORMATION AND REPORTING
APPENDIX E - AGENCY CONSULTATIONS

LIST OF TABLES

Page No.

Table 1-1: Golden Triangle II Solar Project Permit and Approval List 1-1
Table 2-1: Comparison of Impacts by Alternative 2-6
Table 3-1: Land Use and Percent Cover within the Project Site 3-1
Table 3-2: Soils within the Project Site 3-3
Table 3-3: Waterbodies Potentially Affected by the Golden Triangle II Solar Project Access Road Crossings 3-5
Table 3-4: Protected Species with Potential to Occur within the Survey Area 3-6
Table 3-5: TVA Natural Heritage Database - Plants Potentially Occurring within the Survey Area 3-5
Table 3-6: TVA Natural Heritage Database – Aquatic Species Potentially Occurring within 10-miles of Survey Area. 3-6
Table 3-7: Typical Sound Pressure Levels Associated with Common Sound Sources 3-18
Table 3-8: Average Emissions of NAAQS Pollutants in Lowndes County 3-20
Table 3-9: Previously Recorded Archaeological Sites within the Study Area 3-26
Table 3-10: Previous Archaeological Surveys within the Project Study Area 3-26
Table 3-11: Waste Facilities Near the Project Site 3-34
Table 3-12: Summary of Special Handling Precautions for Large Quantity Hazardous Materials 3-36
Table 3-13: Summary of Construction Waste Streams and Management Methods 3-37
Table 3-14: Summary of Operational Waste Streams and Management Methods 3-38
Table 4-1: Unavoidable Impacts and Proposed Mitigation for the Golden Triangle II Solar Project 4-1
Table 4-2: Potential Cumulative Impacts Associated with the Golden Triangle II Solar Project 4-1
Table 5-1: Golden Triangle II Solar Project Environmental Assessment Team 5-1

LIST OF FIGURES

Page No.

Figure 1-1: Golden Triangle II Solar Project Location Map 1-3
Figure 2-1: Aerial Map of the Golden Triangle II Solar Project Site 2-1
Figure 2-2: Aerial Map of the Preliminary Golden Triangle II Solar Project Layout 2-1
Figure 2-3: PV Solar System Energy Flow Diagram 2-1
Figure 3-1: Land Cover within the Project Site 3-1
Figure 3-2: Soils within the Project Site 3-1
Figure 3-3: Prime Farmland Soils within the Project Site 3-1
Figure 3-4: Floodplains within the Project Site 3-1
Figure 3-5: Surface Water and Wetlands within the Project Site 3-1
Figure 3-6: Chalk Outcrop on Parcel Associated with the Project 3-4
Figure 3-7: Potentially Suitable Habitat for Federally Protected Species within the Project Site 3-1
Figure 3-8: General Site Photo of Golden Triangle II Project Site 3-13
Figure 3-9: General Site Photo of Golden Triangle II Project Site 3-14
Figure 3-10: Representative Photo of Single-Axis Tracking PV System in the Morning, Facing East 3-15
Figure 3-11: Representative Photo of Single-Axis Tracking PV System at Midday, Laying Flat 3-16
Figure 3-12: Observed and Projected Temperature Change in Mississippi 3-22
Figure 3-13: Solar Glare Ocular Hazard Plot 3-40
Figure 4-1: Cumulative Impact Map 4-1

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
AADT	Annual Average Daily Traffic
AC	alternating current
Alp	Airport Layout Plan
APE	Area of Potential Effects
BCC	Birds of conservation concern
BESS	battery energy storage system
BFE	base flood elevation
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BMS	Battery management system
BZA	Board of Zoning Appeals
CBMPP	Construction best management practices plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Register
CLOMR	Conditional Letter of Map Revision
CO	Carbon monoxide
CRA	Cultural Resource Analysts
CWA	Clean Water Act
dBA	A-weighted decibel
dbh	diameter at breast height
DC	direct current
DNL	day-night sound level
EA	Environmental Assessment
EO	Executive Order
ESCP	Erosion and Sedimentation Control Plan
FAA	Federal Aviation Administration
F-A-R	Forestry-Agriculture-Recreation

Abbreviation	Term/Phrase/Name
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
GHG	greenhouse gas
GT2	Golden Triangle II Solar Project
GTR	Golden Triangle Regional Airport
HVAC	Heating, ventilation, and air conditioning
IRP	Integrated Resource Plan
kV	kilovolts
L_{dn}	Day-night sound level
L_{eq}	24-hour equivalent sound level
LFP	Lithium iron phosphate
Li-ion	Lithium ion
Lmax	maximum noise level
LTO	Lithium titanate oxide
µg/m^3	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act
MDAH	Mississippi Department of Archives and History
MDEQ	Mississippi Department of Environmental Quality
MDOT	Mississippi Department of Transportation
MDWFP	Mississippi Department of Wildlife, Fisheries, and Parks
MFC	Mississippi Forestry Commission
MLRA	Major Land Resource Area
MPT	main power transformer
MS Solar 6	MS Solar 6, LLC
MSSHPO	Mississippi State Historic Preservation Office
MVT	mid-voltage transformer
MW	megawatt

Abbreviation	Term/Phrase/Name
NAAQS	National Ambient Air Quality Standards
NCM	Lithium nickel cobalt manganese oxide
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	notice of intent
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise sensitive areas
OSHA	Occupational Safety and Health Administration
PEL	Permissible exposure limit
PM_{10}	Particulate matter having a diameter of less than or equal to 10 microns
$PM_{2.5}$	Particulate matter having a diameter of less than or equal to 2.5 microns
PPA	power purchase agreement
ppb	parts per billion
ppm	parts per million
Project	The Golden Triangle II Solar Project
PV	photovoltaic
ROW	right-of-way
RNHD	regional natural heritage database
RSO	Renewable Standard Offer
SGHAT	Solar Glare Hazard Analysis Tool
SHPO	State Historic Preservation Officer

Abbreviation	Term/Phrase/Name
SO2	sulfur dioxide
Solar Facility	A 150-MW AC single-axis tracking photovoltaic solar facility
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-term exposure limit
SWPPP	Stormwater Pollution Prevention Plan
TLV	Threshold limit value
TVA	Tennessee Valley Authority
TVARAM	Tennessee Valley Authority Rapid Assessment Method
TWA	Time weighted average
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
WOTUS	Waters of the U.S.

GLOSSARY OF TERMS

Area of Potential Effect (APE): The APE includes any area within the Project Site where impacts could occur during construction, operation, or both. Because the Project layout is still preliminary and subject to change, MS Solar 6 has selected an APE that is larger than what would likely be needed. The APE for cultural resources also includes areas within a half mile radius that are within the visual line of sight of the parcels where above ground facilities are proposed.

Artesia Substation: The Artesia Substation is TVA's existing 161-kV substation, located along the western end of Mims Road.

Artesia Switching Station: The Artesia Switching Station is TVA's proposed switching station for the Project. TVA's proposed 0.85-acre Artesia Switching Station would be located directly east of the existing TVA Artesia Substation.

Collection Lines: Collection lines are typically buried (at least three feet under the surface) electrical connections that are installed between different sections of arrays and other facilities within the Project Site.

Fencerow: A fencerow is typically located along the perimeter of a parcel that is comprised of agricultural land, pastureland, or open space. It may actually contain a fence or did at one point in the past. There is typically a row of trees or shrubs that grow along the fencerow. Many of the parcels associated with the Golden Triangle Solar Facility have fencerows along the perimeter of the parcels.

Gen-Tie: Approximately 1,665-foot-long tie-in that would connect the proposed Golden Triangle Substation to TVA's proposed Artesia Switching Station.

Golden Triangle I Solar and Battery Energy Storage System (BESS) Facility: The Golden Triangle I Solar and BESS Facility was developed by MS Solar 5, LLC under a separate PPA with TVA. It resulted in 200 MW of AC generating capacity and an additional 50 MW of battery energy storage.

Golden Triangle II Solar and Battery Energy Storage System (BESS) Facility: The Golden Triangle II Solar and BESS Facility is proposed by MS Solar 6, LLC. It would result in 150 MW of AC generating capacity and an additional 50 MW of battery energy storage. The Golden Triangle II BESS would be collocated with the BESS for Golden Triangle I.

Golden Triangle I Substation: The Golden Triangle I Substation was developed by MS Solar 5, LLC as part of the Golden Triangle I Solar and BESS Project. The Golden Triangle II Solar and BESS Facility would connect to the Golden Triangle substation by way of collection lines. A separate and new substation will not be developed as part of this Project.

Project or Proposed Action (Project or GT2): The Project or Proposed Action includes the proposed Golden Triangle II Solar and Battery Energy Storage System (Solar Facility), collection lines, access roads, and the PPA between TVA and MS Solar 6, LLC.

Project Area: The "Project Area" includes the Project Site, as defined below, and the land, roadways, businesses, and homes within approximately ½ mile of the Project Site.

Project Site: The "Project Site" includes all six parcels that would be affected during Project construction and/or operation. The total Project Site is approximately 1,524 acres. Only portions of the total Project Site would be impacted during construction and/or operation of the Project.

Shared Space/Area: This is an approximately 150-acre area of land that was initially identified for placement of PV arrays for Golden Triangle II, that also may contain some PV arrays for Golden Triangle I (only in the event that additional capacity is needed to achieve the 200 MW of AC capacity.

Survey Area: The Survey Area includes the proposed Project Site as well as additional areas that were surveyed by environmental and cultural resources specialists. The Survey Area applies to all parcels associated with the Solar Facility. Slightly more than 1,524 acres were surveyed as part of the environmental and cultural surveys. Visual surveys expanded beyond the limits of disturbance by approximately ½ mile for historic resources and architecture.

1.0 INTRODUCTION

The Tennessee Valley Authority (TVA) has entered into a Power Purchase Agreement (PPA) with MS Solar 6, LLC (herein referred to as "MS Solar 6") to purchase power and environmental attributes generated by the proposed Golden Triangle II Solar and Battery Energy Storage System (BESS) Facility (Solar Facility) in Project (GT2 or Project) in Lowndes County, Mississippi, subject to satisfactory completion of all environmental reviews. The Golden Triangle II Solar and BESS Project (GT2 or Project) would be constructed by MS Solar 6 and would operate separately, under a separate PPA, from the previously evaluated Golden Triangle I Solar and BESS Facility Project. GT2 is expected to generate up to 150 megawatts (MW) of alternating current (AC) capacity with a 50 MW AC – 200-megawatt hour (MWh) BESS. Under the terms of the conditional PPA between TVA and MS Solar 6, dated December 15, 2020, TVA would purchase the electric output and environmental attributes generated by the proposed Solar Facility for an initial term of 20 years, subject to satisfactory completion of all applicable environmental reviews.

The proposed GT2 is located south and east of the town of Artesia, Mississippi (Figure 11). The Project Site includes six individual parcels on approximately 1,524 acres of land, on which the solar array footprints, connection lines, and associated access roads would be constructed. The Solar Facility would consist of multiple parallel rows of photovoltaic (PV) panes on single-axis tracking structures, along with direct current (DC) and AC inverters and transformers. MS Solar 6 would enter into long-term lease agreements or land purchases for all of the Project parcels.

TVA's connection with the Project would occur at the existing TVA Artesia Substation, located approximately three miles north of GT2. Network upgrades to TVA's existing system are not anticipated as a result of the additional capacity to be generated by GT2.

1.1 Purpose and Need for Action

The TVA is a corporate agency of the United States that provides electricity for business customers and local power companies serving nearly 10 million people in parts of seven southeastern states called the Tennessee Valley. TVA's mission is to serve the people of the Tennessee Valley region, and it does that through three main areas of work – energy, the environment, and economic development.

TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. In June 2019, TVA completed an Integrated Resource Plan (IRP) and associated Environmental Impact Statement (EIS) (TVA 2019a and TVA 2019b). The IRP identified the various resources that TVA intends to use to meet the energy needs of the TVA region over the 20-year planning period while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy and reducing environmental impacts. These energy resources from the 2019 IRP included the addition of between 1,500 and 8,000 MW (AC) of solar capacity by 2028 and up to 14,000 MW by 2038 (TVA 2019a). Customer demand for cleaner energy prompted TVA to release a Request for Proposal (RFP) for renewable energy resources (2020 Renewable RFP). The MS Solar 6 PPA that resulted from this RFP will help TVA meet immediate needs for additional renewable generating capacity in response to customer demands

and fulfill the renewable energy goals established in the 2019 IRP. The Proposed Action would provide cost-effective renewable energy consistent with the IRP and TVA goals.

1.2 Scope of this Environmental Assessment

Pursuant to the National Environmental Policy Act of 1969 (NEPA), federal agencies are required to evaluate the potential environmental impacts of their proposed actions.). Because the likelihood of a reversal of certain changes that were outlined in the CEQ-issued revised 2020 NEPA regulations (85 FR 43304-43376, July 16, 2020), this environmental assessment (EA) was prepared consistent with Council on Environmental Quality (CEQ) regulations for implementing NEPA at 40 CFR 1500-1508 issued in 1978 (43 FR 55990, Nov. 29, 1978), with minor revisions in 1979 and 1986, as well as TVA regulations at 18 CFR 1318 issued in 2020 (85 FR 17434, Mar. 27, 2020) (see 40 CFR 1506.13).

TVA's Proposed Action would result in the construction and operation of the proposed Golden Triangle II Solar and BESS Facility by MS Solar 6. The scope of this EA therefore focuses on impacts related to the construction and operation of the proposed Solar Facility.

This EA describes the existing environment at the Project Site (Figure 1-1), analyzes potential environmental impacts associated with the Proposed Action and the No Action Alternatives, and identifies and characterizes potential cumulative impacts from the proposed Project in relation to other recent, ongoing, and reasonably foreseeable future proposed activities within the surrounding area of the Project Site.

Under the PPA, TVA's obligation to purchase power is contingent upon the satisfactory completion of the appropriate environmental review and TVA's determination that the Proposed Action will be "environmentally acceptable." To be deemed "environmentally acceptable", TVA must assess the impact of the Project on the human environment to determine whether (1) any significant impacts would result from the location, operation, and/or maintenance of the proposed Project and/or associated facilities, and (2) the Project would be consistent with the purposes, provisions, and requirements of applicable federal, state, and local environmental laws and regulations.

Based on internal scoping and identification of applicable laws, regulations, executive orders, and policies, TVA identified the following resource areas for analysis within this EA: Land Use (includes Natural Areas and Recreation); Geology, Soils, and Prime Farmland; Water Resources; Biological Resources; Visual Resources; Noise; Air Quality and Greenhouse Gas Emissions; Cultural Resources; Utilities; Waste Management; Public and Occupational Health and Safety; Socioeconomics; Environmental Justice; and Transportation.

This EA consists of six chapters discussing the Project alternatives, potentially impacted resource areas, and analyses of these impacts. Additionally, this document includes five appendices, which generally contain more detail on technical analyses and supporting data. The structure of the EA is outlined below:

- **Section 1.0**: Describes the purpose and need for the Project, the decision to be made, related environmental reviews and consultation requirements, necessary permits or licenses, and the EA overview.
- **Section 2.0**: Describes the Proposed Action and No Action Alternatives, provides a comparison of alternatives, and discusses the Preferred Alternative.
- **Section 3.0**: Discusses the affected environment and the potential direct and indirect impacts on these resource areas. Mitigation measures are also proposed, as appropriate.
- **Section 4.0**: Discusses the cumulative impacts in relation to other ongoing and reasonably foreseeable proposed activities within the surrounding area of the Project Site.
- **Section 5.0**: Provides the List of Preparers for the preparation of this EA.
- **Section 6.0:** Provides the list of Literature Cited in this EA.
- **Appendix A**: TVA's Site Clearing and Grading Specifications
- **Appendix B**: Golden Triangle II Wetland and Waterbody Delineation Report
- **Appendix C**: Golden Triangle Solar Project Hydrology Study
- **Appendix D**: Protected Species Reporting
- **Appendix E**: Agency Consultations

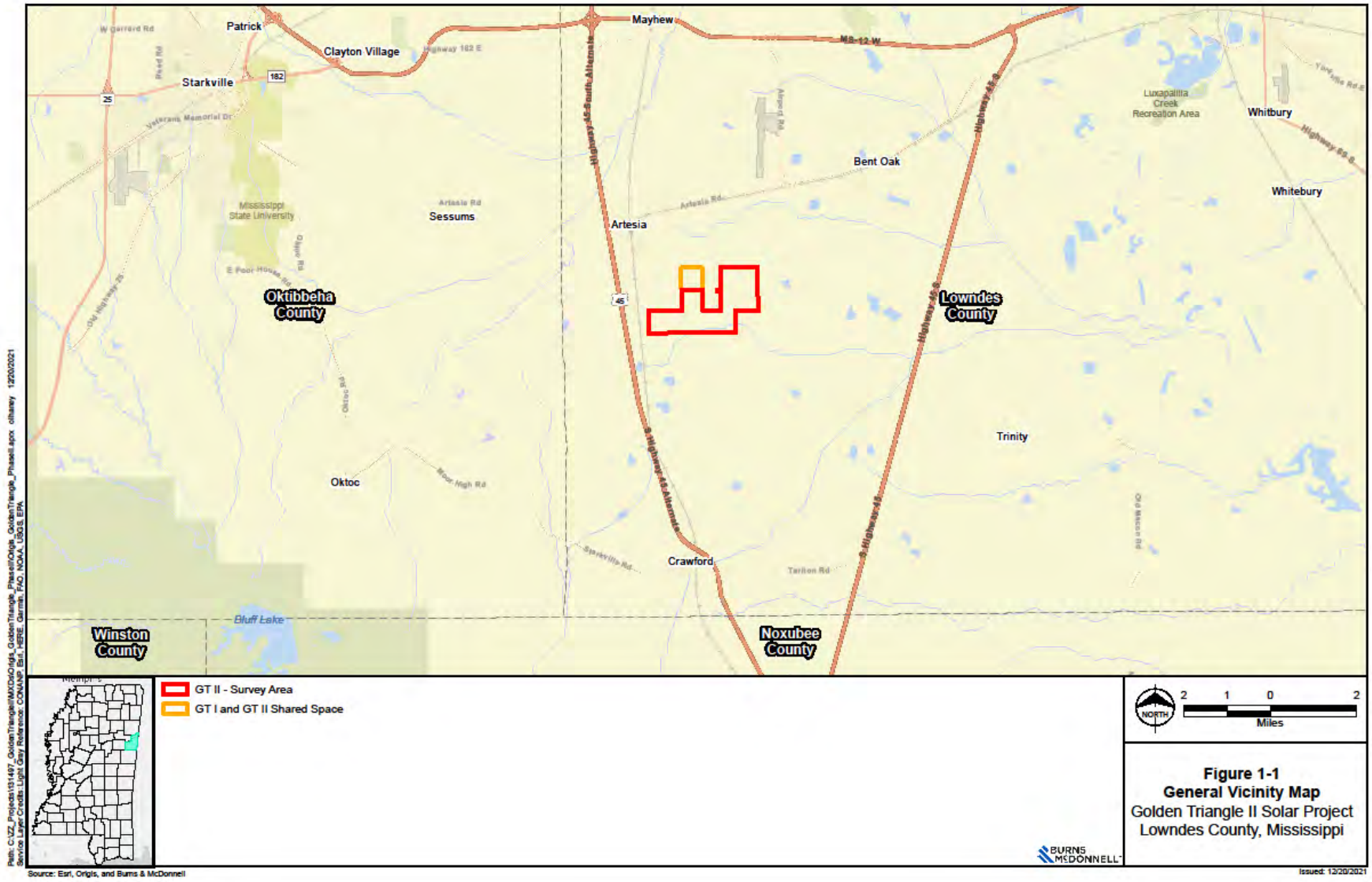


Figure 1-1: Golden Triangle II Solar Project Location Map

1.3 Public Involvement

A copy of this draft EA is being sent to local, state, and federal agencies and individuals who indicated an interest in the Project. TVA notified interested federally recognized Native American Tribes, elected officials, and other stakeholders that the draft EA was available for review and comment for a 30-day period. An electronic version of the document was posted on the TVA website where comments could also be submitted electronically. Public notices were locally published to solicit comments from other agencies, the general public, and any interested organizations. Federal agencies that received the notification consisted of the United States Department of Agriculture (USDA) Natural Resource Conservation Service, the United States Army Corps of Engineers (USACE), and the U.S. Fish and Wildlife Service (USFWS). State and local agencies that received the notification consisted of the Mississippi Department of Agriculture, Mississippi Department of Economic and Community Development, Mississippi Department of Environmental Quality (MDEQ), and Mississippi Wildlife Department of Wildlife and Fisheries (MDWF). Tribes that received notification of the Project consisted of the Eastern Shawnee Tribe of Oklahoma, Choctaw Nation of Oklahoma, The Chickasaw Nation, Thlopthlocco Tribal Town, Kialegee Tribal Town, Absentee Shawnee Tribe of Indians of Oklahoma, Coushatta Tribe of Louisiana, Muscogee (Creek) Nation, Alabama-Coushatta Tribe of Texas, Mississippi Band of Choctaw Indians, Jena Band of Choctaw Indians, and the Shawnee Tribe.

TVA will carefully review any comments received on the draft EA and address them, as appropriate, in the final EA.

1.4 Necessary Permits or Licenses

There are multiple permits, approvals, registrations, and consultations that would be required for the Project. Table 1-1, below, provides an overview of the anticipated permits and approvals. Further details on anticipated permits and approvals are provided in the following sections.

Table 1-1: Golden Triangle II Solar Project Permit and Approval List

Permit/Approval	Associated Documentation	Lead Agency
Federal Permits, Approvals, Registrations, or Consultations		
Endangered Species Act Section 7 (ESA)	Protected species Habitat Assessment Report. Informal Section 7 ESA consultation package.	U.S. Fish and Wildlife Service (USFWS)
Migratory Bird Treaty Act (MBTA)		
Bald and Golden Eagle Protection Act (BGEPA)		
Farmland Protection Policy Act (FPPA)	None. FPPA applies to Projects receiving federal funding. The Solar Facility would be funded by MS Solar 6.	Natural Resources Conservation Service (NRCS)

Permit/Approval	Associated Documentation	Lead Agency
Section 404 Clean Water Act Nationwide Permits 3 and/or 14 for access road crossings	Wetland and Waterbody Delineation Report	U.S. Army Corps of Engineers
State Permits, Approvals, Registrations, or Consultations		
Section106 National Historical Preservation Act Consultation	Phase I Cultural Resources Survey Report	Mississippi Department of Archives and History / State Historic Preservation Officer
§401 Clean Water Act – Water Quality Certification	Wetland and Waterbody Delineation Report	Mississippi Department of Environmental Quality (MDEQ)
Construction General Permit No. MSR10 under the National Pollutant Discharge Elimination System (NPDES)	Stormwater Pollution Prevention Plan and Spill Prevention, Control, and Countermeasures Plan.	MDEQ
Natural Heritage Program Consultation	Protected Species Habitat Assessment Report	MDEQ, Dept. of Wildlife, Fisheries, and Parks
Driveway/Overhead Electrical Encroachment Permit	Site Plan/Driveway Access Plan	Mississippi Department of Transportation (MDOT)
Local Permits, Approvals, Registrations, or Consultations		
Floodplain Development Permit	Individual Elevation Certificates for each tracker array in floodplain	Lowndes County Building Inspection Department
Site Plan Permit	Construction Drawings, MDEQ NPDES Approval	Lowndes County Buildings and Grounds Office
Building Permit	Electrical/Structural Plans	Lowndes County Buildings and Grounds Office

1.4.1 Clean Water Act and Rivers and Harbors Act

The U.S. Army Corps of Engineers (USACE) administers Section 404 of the Clean Water Act (CWA), which regulates dredge and fill activities in waters of the U.S. (33 USC 1344), as well as Section 10 of the Rivers and Harbors Act, which regulates the placement of structures in waters of the U.S. (33 USC 403). The Project is located within the Mobile District.

Impacts to jurisdictional waters of the U.S. (as defined in 40 CFR 230.3[s]) would require authorization from USACE under Section 404 of the CWA. Impacts resulting in a permanent loss of wetlands greater than 0.5 acre would require a Section 404 Individual Permit (IP), which may include mitigation and public involvement. The USACE established the Nationwide Permit (NWP) program to streamline the Section 404 permitting process for actions that would have no more than a minimal effect on the environment. If permanent wetland impacts (i.e., permanent fill resulting in the loss of wetland function) range from 0.1 to 0.5 acre, USACE notification and application is required to obtain an NWP. The Project would result in minimal impacts on wetlands, as discussed in greater detail in section 3.3 of this EA. Impacts on USACE-jurisdictional waterbodies would occur in areas where facility access roads and collection lines must cross

streams within the Project Site. Based on conversations with the Mobile District USACE, approval under an NWP 12 is anticipated.

1.4.2 Endangered Species Act of 1973

The Endangered Species Act of 1973 (ESA), as amended, was enacted to protect, and recover imperiled species and the ecosystems upon which they depend. The law requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or the NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife. Further details regarding species listed as Threatened and Endangered (T&E) under the ESA are included in section 3.4.1.4.

1.4.3 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings (including issuance of permits) on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. State Historic Preservation Officers (SHPOs) and Tribal Historic Preservation Officers (THPOs) serve a critical role in implementing many responsibilities under the NHPA. Central to this framework is the National Register of Historic Places (NRHP), which is the official list of historic properties worthy of preservation. The Mississippi Department of Archives and History (MDAH), which acts as the SHPO for the State of Mississippi, has reviewed and commented on potential Project impacts on resources of cultural significance within the state. A phase I cultural resources survey, utilizing pedestrian and shovel tests along pre-approved transects, was required for this Project. The SHPO does not issue permits; however, approvals by other federal agencies cannot be final without review by and clearance from the SHPO.

1.4.4 Mississippi Natural Heritage Program

The Mississippi-protected species list includes animal species for which legal protection is provided under the Mississippi Nongame and Endangered Species Conservation Act of 1974. The act declares that “Species or subspecies of wildlife indigenous to the state should be accorded protection in order to maintain and to the extent possible enhance their numbers.” Under state law, the Mississippi Department of Environmental Quality (MDEQ), Department of Wildlife, Fisheries, and Parks has responsibility for reviewing this list and providing recommendations for revisions as needed every two years.

Mississippi law specifically states that rules and regulations related to the protection of state protected species will not affect rights on private property. Prohibitions are limited to the capture, killing, or selling of protected species and the protection of the habitat of these species on public lands.

1.4.5 Mississippi Department of Environmental Quality

The MDEQ Stormwater and 401 Water Quality Branch administers the Section 401 Water Quality Certification program in conjunction with the USACE. MDEQ offers general permits for activities that would result in only very minor impacts on wetlands. Proposed minor wetland alteration activities may obtain coverage by submitting a signed and completed application for a general permit, along with any other required information. Work shall not commence until a written Notice of Coverage (NOC) from MDEQ is received.

The MDEQ Stormwater and 401 Water Quality Branch also administers the National Pollution Discharge Elimination System (NPDES) construction stormwater permitting program in Mississippi. In compliance with the Mississippi Water Quality Control Act, MDEQ authorizes point source discharges of stormwater into waters of the state. A notice of intent (NOI) for General NPDES Permit for Stormwater Discharges from Large Construction Activities (permit no. MSR10) would be required for the Project. The NOI form, Stormwater Pollution Prevention Plan (SWPPP), and an Erosion, Sediment and Pollution Control Plan (ES&PCP) would be submitted at least 30 days prior to the commencement of land disturbing activities. Written approval through a NOC must first be received prior to initiating land disturbing activities. These documents will include specific information about the construction site, construction best management practices (BMPs), and stormwater discharge receiving waters.

1.4.6 County and Municipality Permitting

No ordinances or requirements specific to solar facilities exist in Lowndes County; however, Lowndes County does require a development review process. Based on initial coordination with the County, a building permit for the structural and electrical scope of the Project will be required. This review will be handled by the County Buildings and Inspection Department. The County will provide a site plan permit once the construction drawings are reviewed and approved by the County Board of Supervisors. A copy of the MDEQ NPDES approval must be provided to the County. Since portions of the Project would occur within a floodplain, MS Solar 6 would require a no rise/no impact and elevation certification. The County has coordinated with Mississippi Emergency Management Agency (MEMA) on what would be required. The County has indicated that it will require an individual elevation certificate for each tracker array located within the Federal Emergency Management Agency (FEMA) 100-year floodplain. The certificate must show that the elevation of the “drip line”, or lowest point of the individual array at full tilt, is a minimum of one foot above the 100-year base flood elevation.

Vegetative waste from clearing activities would be burned or chipped onsite. If open burning of debris from tree clearing on the site is planned, the appropriate open burning permits would be obtained from the Mississippi Forestry Commission (MFC). Information on open or surface burning issued by MFC would be followed. Only trees and brush from the Project Site would be burned. Weather conditions would be monitored and considered to ensure safety and minimize degradation to air quality during the open burning of any vegetation cleared from the Project Site.

2.0 DESCRIPTION OF PROPOSED ALTERNATIVES

This section provides a description of the analysis and criteria used in identifying the Preferred Alternative. It provides a description of alternatives considered and compares the alternatives to the Proposed Action. This EA evaluates two alternatives: The No Action Alternative and the Proposed Action Alternative.

2.1 No Action Alternative

The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative are measured. Under the No Action Alternative, TVA would not purchase the power generated by the Project under the 20-year PPA with MS Solar 6 (i.e., TVA would not be involved with the Project). If TVA were to select this alternative and MS Solar 6 elected not to proceed with the Project, then MS Solar 6 would not construct or operate the Solar and BESS Facilities. Existing conditions (land use, natural resources, visual resources, physical resources, and socioeconomics) at the Project Site would remain unchanged. TVA would continue to rely on other sources of generation described in the 2019 IRP (TVA 2019a) to ensure an adequate energy supply and to meet its goals for increased renewable energy and low GHG-emitting generation.

2.2 Proposed Action Alternative

Under the Proposed Action Alternative, MS Solar 6 would construct and operate an up to 150-MW AC single-axis tracking PV Solar and up to 50-MW BESS Facility in Lowndes County, Mississippi (referred to as the Solar Facility), and TVA would purchase renewable energy from the facility under the 20-year PPA with MS Solar 6. GT2 would generate up to 150 MW AC output for transmission to TVA's electrical network. MS Solar 6 would enter into long-term leases or purchases on approximately 1,524 acres of land on six individual parcels along the southeastern town limits of Artesia, Mississippi. The power generated from the Solar Facility would be sold to TVA under the terms of the PPA. The Project would connect to the existing TVA electrical network via the existing Golden Triangle gen-tie line to TVA's proposed Artesia Switching Station within the existing Artesia Substation. Figure 2-1 provides an overview of the Project Site as well as the parcel boundaries of properties that would be affected during construction.

As discussed in Section 1.2, this EA assesses (1) the impact of TVA's action to enter into the PPA with MS Solar 6, (2) the associated impacts of the construction and operation of the Solar Facility by MS Solar 6, and (3) the interconnection components by TVA.

2.2.1 Project Description

The proposed Solar Facility would occupy portions of the Project Site that are predominantly comprised of cultivated agricultural fields and pastureland (Figure 2-1). The perimeter of the developed facilities would be enclosed with security fencing. Within the limits of the fenced facility would be the arrays of solar panels, inverters, electrical cabling, and other related infrastructure such as the access roads. The remaining portions of the Project Site would remain undeveloped. Additional information regarding existing land use conditions is detailed in section 3. Figure 2-2 displays the preliminary solar array layout within the Project Site.

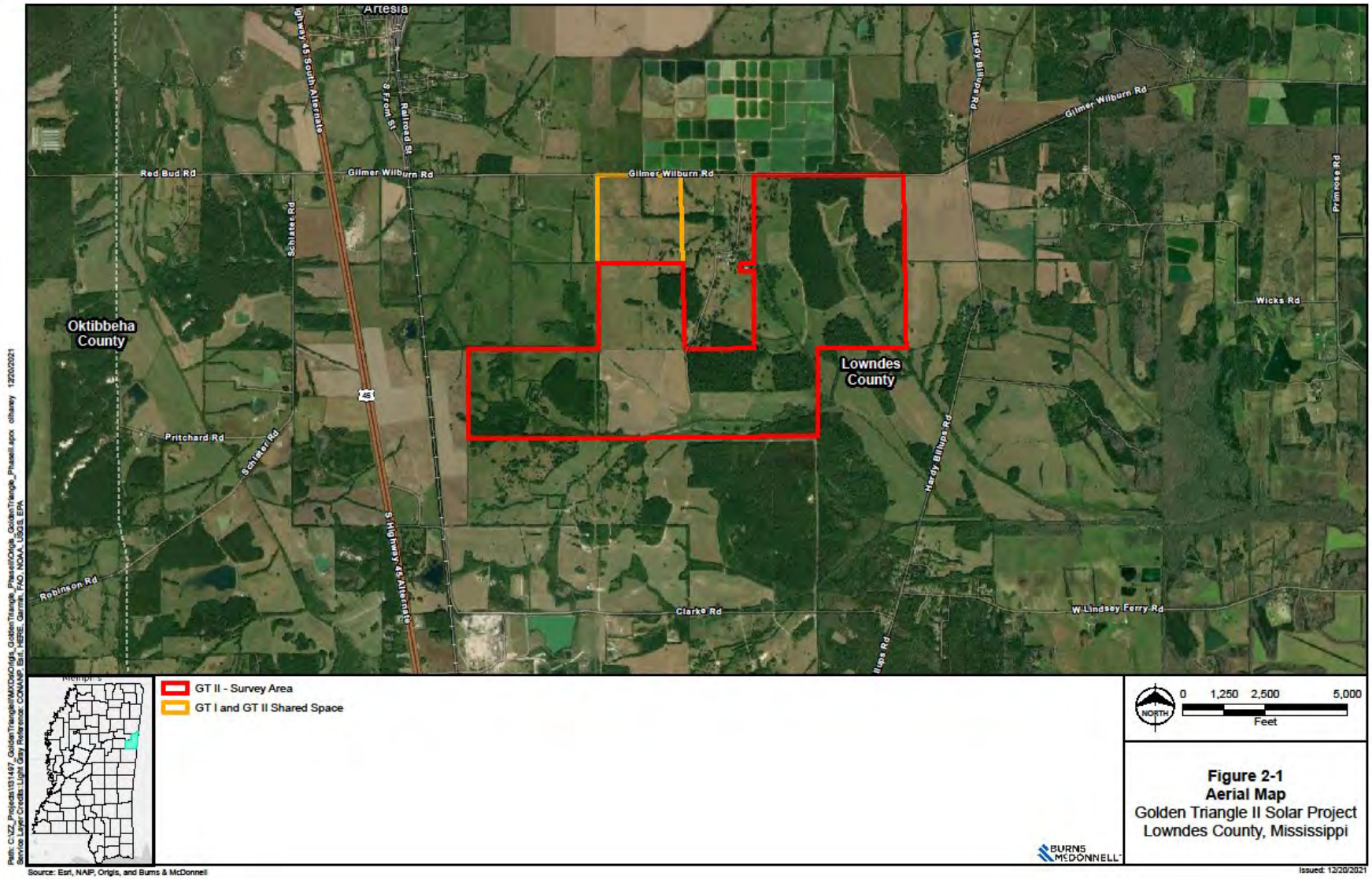


Figure 2-1: Aerial Map of the Golden Triangle II Solar Project Site

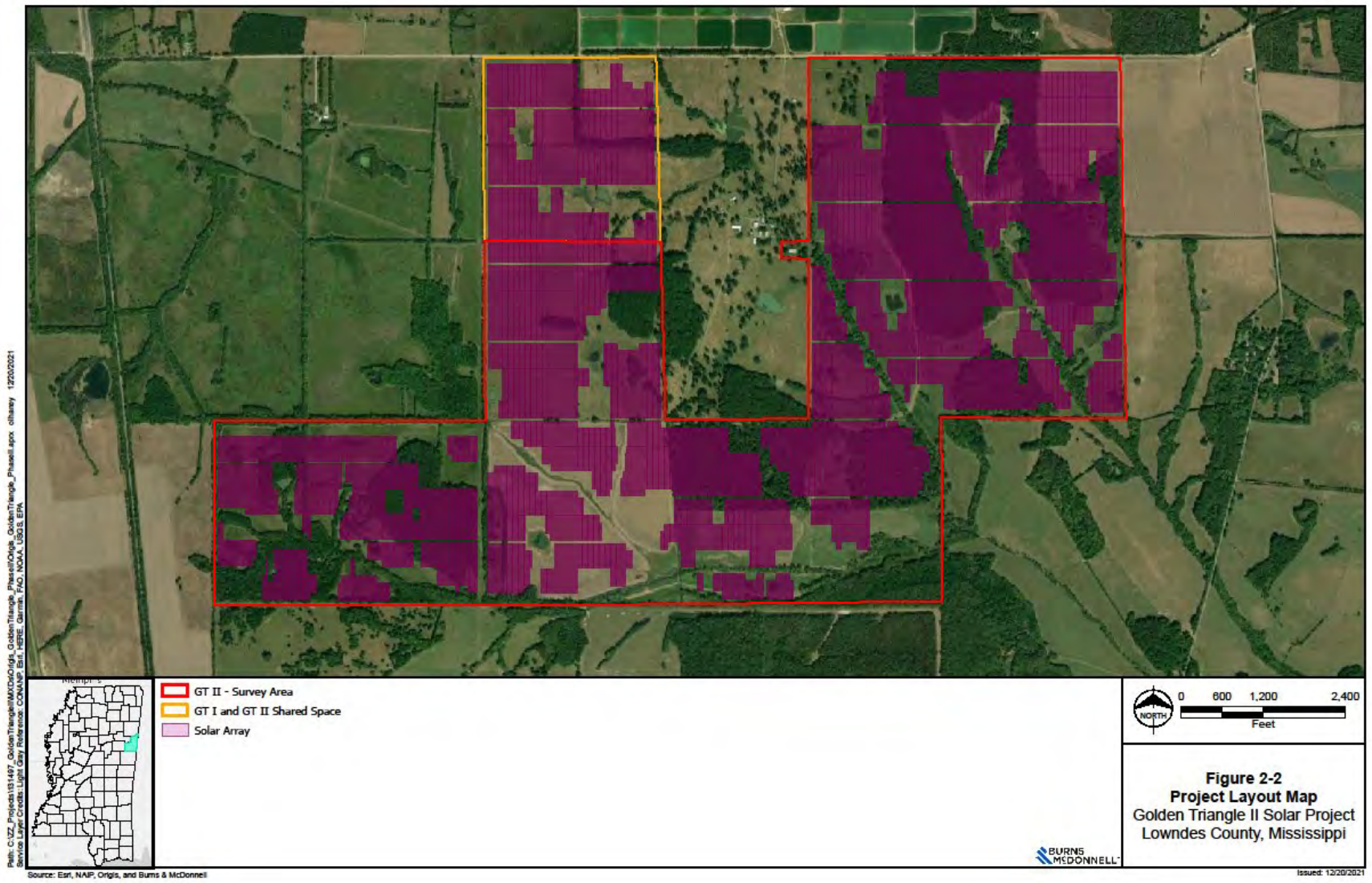
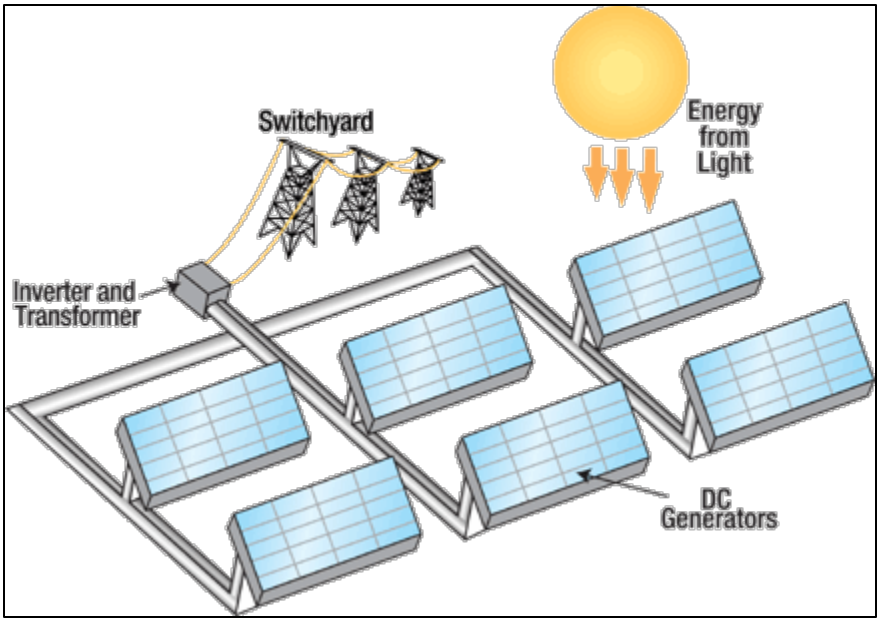


Figure 2-2: Aerial Map of the Preliminary Golden Triangle II Solar Project Layout

GT2 would convert sunlight into direct current (DC) electrical energy within the PV panels (modules) as very generally depicted in Figure 2-3. PV power generation is the direct conversion of light into electricity at the atomic level. Some materials exhibit a property known as the photoelectric effect that causes them to absorb energy as photons of light and then release energy as electrons. When the free electrons are captured, an electric current is produced, which can be used as electricity (TVA 2014).

Figure 2-3: PV Solar System Energy Flow Diagram



The Project would be composed of PV modules mounted together in arrays. Groups of panels would be connected electrically in series to form "strings" of panels, with the maximum string size chosen to ensure that the maximum inverter input voltage is not exceeded by the string voltage at the Project's high design temperature. The panels would be located in individual arrays consisting of the PV arrays and an inverter station on a concrete pad or steel piles, to convert the DC electricity generated by the solar panels into AC electricity. The portions of the Project Site outside the fenced-in areas would not be developed. The modules would be attached to single-axis trackers that allows all the panels to pivot along an axis to follow the path of the sun from east to west across the sky. The trackers would be attached to steel pile foundations.

Collections of strings or rows of panels would be connected by underground DC cabling to a central inverter that would convert the DC electricity into AC electricity so that it could be transmitted to the electrical grid. Each inverter would have a collocated mid-voltage transformer (MVT) which boosts the AC voltage to account for the standard electrical loss between the central inverters and the onsite Project substation. From the MVTs, a network of underground AC power cables would connect to a single main power transformer (MPT) which would be located within the previously reviewed 161-kV Golden Triangle Substation. Cables would be installed in trenches approximately 3- to 4-feet deep and 2- to 12-inches wide.

Earth-compacted roads would provide access to each inverter block for the purposes of operations, maintenance, and repairs. The locations of inverter blocks and access roads have not been finalized. Additional site information including layouts and collection line locations will be provided in the Final EA.

2.2.2 Solar Facility Construction

Construction activities would take approximately 17 months to complete using a crew that ranges from 200 to 300 workers. Work would generally occur up to seven days a week during daylight hours. Additional hours after dark could be necessary to make up schedule deficiencies or to complete critical construction activities. Night-time construction, if determined necessary, would require lighting in some areas of the Project Site. Any additional night-time lighting would be downward-facing and timer- and/or motion-activated to minimize impacts to wildlife and any surrounding receptors, including nearby households.

Site preparation is generally required prior to construction of the Solar Facility and assembly of the solar arrays. Site preparation typically includes surveying and staking, removal of tall vegetation/small trees, light grading, clearing and grubbing, installation of security fencing around components near one another and not separated by public roads, erosion prevention and sediment control BMPs, and preparation of construction laydown areas. Solar array assembly and construction includes driving steel piles into the ground for the tracker support structures, installation of solar panels, and electrical connections and testing/verification.

Approximately 40 acres of the Project Site would be used as construction assembly areas (also called laydown areas) for worker assembly, safety briefings, vehicle parking, temporary offices, and material storage during construction. Some of these assembly areas, which would be spread out across the Project Site, would be staged within the locations proposed for the PV arrays. The laydown areas would be onsite for the duration of construction. Temporary construction trailers for material storage and office space would be parked onsite. Following completion of construction activities, most trailers, unused materials, and construction debris would be removed from the Project Site. If appropriate, an operations and maintenance building would utilize one of the last remaining construction trailers. Construction materials would be transported by truck and/or rail to the Project Site, where materials would be staged, assembled, and moved into place.

MS Solar 6 would use the existing landscape, such as slope, drainages, and roadways where feasible, minimizing grading work where practicable. Grading activities that could not be avoided would be performed using mobile earthmoving equipment, resulting in a fairly consistent slope on land. Native topsoil would be preserved to the greatest extent practicable during grading. Native topsoil would be stockpiled onsite and preserved for redistribution over the disturbed area after grading is complete. After construction, the disturbed areas would be seeded with a native seed mixture of certified weed-free, low-growing, noninvasive grasses, and herbaceous plants. Flowering vegetation also would be used, if available, to attract pollinator species such as honeybees and butterflies. Erosion control BMPs would be regularly inspected and maintained until vegetation in the disturbed areas has been established to the extent it meets permit

restoration requirements. Water would be used for fugitive dust control and/or soil compaction during construction on an as-needed basis. Water used during construction would either be trucked in from a municipal source or withdrawn from an onsite water well.

To manage stormwater during construction, onsite temporary sedimentation basins, sediment traps, or diversion berms would be constructed within the disturbed area of the Project Site. If needed, a diversion berm would be constructed along portions of the Project Site perimeter to contain stormwater onsite. Any necessary sedimentation basins and/or traps would be compliant with MDEQ requirements. If necessary, sedimentation basins and traps would be constructed either by impoundment of natural depressions or by excavating the existing soil. The floor and embankments of the basins would be allowed to naturally reestablish native vegetation after construction (or replanted as necessary) to provide natural stabilization and minimize subsequent erosion. Sediment traps would be placed in strategic drainage areas to prevent sediment from entering onsite jurisdictional streams and wetlands. Offsite sediment migration would be minimized by the placement of silt fencing around each area of ground disturbance within the Project Site. These stormwater BMPs would minimize the potential for sediment to enter onsite jurisdictional streams and wetlands and to minimize sediment migration offsite during construction. Once sufficient revegetation cover is achieved, the Project Site would be considered stabilized and temporary construction BMPs would be discontinued and/or removed.

Construction activities would be sequenced to minimize the time that bare soil in disturbed areas is exposed. In addition to the silt fencing described above, other appropriate controls, such as temporary cover, would be used as needed to minimize exposure of soil and eroded soil from leaving the work area. Disturbed areas, including road shoulders, construction office and laydown areas, ditches, and other Project-specific locations, would be seeded post-construction. If conditions require, soil may be further stabilized by mulch or sprayable fiber mat. Where required, hay mulch would be applied at three tons per acre and well distributed over the area. As part of NPDES permit authorization (see section 3.2), the site-specific SWPPP would be finalized with the final grading and civil design and would address all construction-related activities prior to construction commencement. Further guidance for clearing and construction activities can be found in Appendix A.

The design of the tracker support structures could vary depending on the final PV technology and vendor selected. Based on preliminary geotechnical survey results for the Project Site, the trackers would be attached to driven steel pile foundations. The steel pile foundations are typically galvanized and used where high load-bearing capacities are required. The pile is driven with a hydraulic ram. Soil disturbance is restricted to the pile insertion location to a depth typically less than 20 feet below grade; there is also potential for temporary soil disturbance from the hydraulic ram machinery, which is about the size of a small tractor. The tracker design and pile foundation design would be sealed by a registered Professional Engineer and Structural Engineer, respectively. Screw piles are another option for PV foundations which are drilled into the ground with a truck-mounted auger. Screw piles create a similar soil disturbance footprint as driven piles.

Solar panels would be manufactured offsite and shipped to the Project Site ready for installation. All final electrical collection cables would be underground, and electricians and assistants would run the electrical cabling throughout the Solar Facility. The trenches to hold the cabling would be approximately 3- to 4-feet deep and 2- to 12-inches wide. The trenches would be backfilled with native soil and appropriately compacted.

The MPT would be supported on a concrete foundation within the Golden Triangle Substation. An aboveground transmission cable would be constructed to connect the MPT through a circuit breaker.

Access roads would be needed to allow vehicular access within the solar facility. Typically, new permanent or temporary access roads are designed and located to avoid severe slope conditions and to minimize impacts to environmental resources. Information on access road siting is not available at this time, and additional (supplemental NEPA) analysis would be conducted if there are changes or upgrades to the scope of this Project. Access roads are typically about 12 to 16 feet wide and are surfaced with dirt, mulch, or gravel. Culverts and other drainage devices, fences, and gates would be installed, as necessary. Culverts installed for temporary access roads in any perennial streams would be removed following construction. However, in ephemeral streams (also known as wet weather conveyances - streams that only flow following a rainfall) the culverts would be left or removed, depending on the wishes of the landowner or any permit conditions that might apply. If desired by the property owner, TVA would restore new temporary access roads to previous conditions following construction. Additional applicable ROW clearing and environmental quality protection specifications are listed in *TVA ROW Clearing Specifications, Environmental Quality Protection Specifications for Transmission Line Construction, and Transmission Construction Guidelines Near Streams*.

2.2.3 Operations

Operation of the Golden Triangle Solar 2 Facility would require up to 1-2 full-time staff to manage the solar facility and conduct regular inspections. Inspections would include identifying any physical damage of panels, wiring, central inverters, transformers, and interconnection equipment, and drawing transformer oil samples. Vegetation on developed portions of the Project Site would be maintained to control growth and prevent overshadowing or shading of the PV panels. Trimming and mowing would likely be performed several times per year, depending on growth rate, to maintain an appropriate ground cover height of no more than approximately 12 to 18 inches. During operation of the Solar Facility, selective use of U.S. Environmental Protection Agency (USEPA)-approved spot herbicides may also be employed around structures to control invasive weeds.

The proposed Solar Facility would be monitored remotely from Origis Energy's Control Center in Austin, Texas, 24 hours a day, seven days a week to identify security or operational issues. In the event a problem is discovered during nonworking hours, a repair crew or law enforcement personnel would be contacted if an immediate response were warranted.

Moving parts of the Solar Facility would be restricted to the east-to-west tracking motion of the single-axis solar modules, which amounts to a movement of less than a one degree angle every few minutes. This movement is barely perceptible. In the late afternoon, module rotation would start to move from west-to-east in a similar slow motion to minimize row-to-row shading. At sunset, the modules would track to a flat or angled stow position. Otherwise, the PV modules would simply collect solar energy and transmit it to the TVA power grid. With the exception of fence repair, vegetation control, and periodic array inspection, repairs, and maintenance, the Solar Facility would have relatively little human activity during operation. No significant physical disturbances would occur during operation. Permanent lighting is anticipated as a potential onsite need during facility operations, independent of the potential operations and maintenance building. Permanent lighting would be downward-facing and timer- and/or motion-activated to minimize impacts to surrounding areas.

Rainfall in the region should be adequate to remove dust and other debris from the PV panels while maintaining acceptable energy production; therefore, manual panel washing is not anticipated unless a site-specific issue is identified. If later identified, module washing would occur no more than twice a year and would comply with appropriate BMPs.

2.2.4 Decommissioning and Reclamation

MS Solar 6 would operate the Project and sell power to TVA under the terms of the PPA for the first 20 years of its life. At the end of the term of the PPA, MS Solar 6 would assess whether to cease operations at the Solar Facility or to replace equipment and attempt to enter into a new power purchase agreement or make some other arrangement to sell the power. If operations were ceased, the facility would be decommissioned and dismantled, and the Project Site would be restored to its pre-construction conditions. In general, the majority of decommissioned equipment and materials would be recycled. Materials that could not be recycled would be disposed of at an approved facility. As the lease agreement with the landowners are for at least 35 years, site control would be maintained for longer than the 20-year PPA period, and MS Solar 6 may attempt to renegotiate further PPA terms with TVA. At the end of the 20-year contract period, TVA may also choose to purchase and operate the facility. If additional PPA terms are arranged or if TVA chooses to operate the facility, these activities would be evaluated through separate NEPA processes.

2.3 Alternatives Eliminated from Further Consideration

Numerous criteria were considered throughout the process of identifying a suitable site within TVA's service area that would meet the purpose and need of this Project as well as expanding TVA's renewable energy portfolio (TVA 2019a). The following is a list of key factors MS Solar 6 took under consideration during the site selection process.

- Site must be large-scale enough to accommodate enough PV panels to generate 150-MW AC output for transmission to the electrical network.

- Large contiguous parcels of land with at least 1,500 acres available for solar panel installation and additional acreage for related infrastructure.
- Availability of nearby electric infrastructure for interconnection to TVA's system with sufficient available transmission capacity.
- Generally flat landscape with minimal slope; preferably previously disturbed contiguous land with minimal existing infrastructure obstacles.
- Minimal presence of forested areas and wetlands.
- Parcels with appropriate local zoning regulations and located away from densely populated areas.
- Land that would allow developers to avoid and/or minimize impacts on known sensitive biological, visual, and cultural resources.

The process of screening potential locations and ultimately eliminating sites that did not possess the necessary attributes led to the selection of the Project Site.

2.4 Comparison of Alternatives

This EA evaluates the potential environmental effects that could result from implementation of the No Action Alternative or the Proposed Action Alternative at the proposed Project Site in Lowndes County, Mississippi. The analysis of impacts described in this EA is based on current conditions as well as potential future conditions on the parcels associated with the Project and the surrounding area. A comparison of potential impacts from each alternative is summarized in Table 2-1.

Table 2-1: Comparison of Impacts by Alternative

Resource Area	Impacts from the No Action Alternative	Potential Impacts from the Proposed Action Alternative
Land Use	No direct or indirect impacts anticipated.	Conversion of agricultural, pastureland, and forest to solar generation is consistent with Lowndes County's zoning. Minor changes from Project construction would not result in a long-term adverse direct impact.
Geology, Soils, and Prime Farmlands	No direct or indirect changes anticipated.	Geology: Minor direct impacts on potential shallow subsurface geological resources.
		Soils: Minor direct impacts on soils from potential minimal increases in erosion and sedimentation during construction. Once stabilized and facility is operational, impacts on soils would be offset by the beneficial effects to soil health with the use of native and noninvasive vegetation.
		Farmlands: direct impacts on farmland from the conversion of agricultural land to solar for the duration of the Project.

Resource Area	Impacts from the No Action Alternative	Potential Impacts from the Proposed Action Alternative
Water Resources	No direct or indirect changes to current conditions anticipated.	Groundwater: Negligible direct impacts on the supply from use of a new water well during operation of Solar Facility. Minor beneficial effects are anticipated from the reduction in fertilizer and pesticide application.
		Surface water: Minor beneficial impacts on surface water due to the reduction in fertilizer and pesticide application once agricultural operations are not occurring. Minor short-term impacts from erosion and sedimentation during construction (until site is stabilized).
		Wetlands: No permanent impacts on wetlands. No proposed placement of permanent structures within wetlands.
		Floodplains: There are approximately 135 acres of FEMA designated floodplain within the Project Site; however, MS Solar 6 would not install arrays within the entire floodplain. Required permits and approvals would be obtained for placement of PV panels within floodplains prior to initiating construction.
Biological Resources	No direct or indirect impacts anticipated.	Vegetation: Three main vegetation communities would be affected: actively cultivated bean and corn fields, hay pastures, and forested uplands.
		Wildlife: Moderate adverse impacts on wildlife during construction. Some forested areas would be converted to open land for solar array placement. Wildlife that can use early successional habitat is expected to return to the area once operational. The Project is not anticipated to have long-term significant impacts on migratory bird species of concern.
		Protected Species: No known occurrences of protected species were found within the Survey Area. The Project is not anticipated to significantly affect federal or state-listed species.
Visual Resources	No direct or indirect impacts anticipated.	During construction, minor temporary impacts on visual resources would occur due to the alteration of the existing agricultural viewshed and increased construction activity. During operation of the Solar Facility, moderate direct impacts in the immediate Project vicinity due to the presence and quantity of PV panels. Impacts on residents and visitors to the town of Artesia would be minimized through the presence of existing natural screening buffers including forest areas and topography. If existing buffers are not sufficient in shielding residents in Artesia from the Solar Facility, MS Solar 6 would install a privacy fence or shrubbery along the perimeter of the Project Site on a case-by-case basis.
Noise	No direct or indirect impacts anticipated.	Minor temporary noise impacts would be experienced during construction. Negligible adverse impacts from noise associated with operation.

Resource Area	Impacts from the No Action Alternative	Potential Impacts from the Proposed Action Alternative
Air Quality and Greenhouse Gas Emissions	No direct or indirect impacts anticipated. Continue using fossil fuels.	Air Quality: Minor direct impacts on air quality could occur during site preparation involving heavy, earth moving construction equipment (temporary emissions). No adverse impacts on air quality from operations.
		GHG: Temporary and minor increases in GHG emissions would be expected during construction from operation of equipment. However, a net positive impact would occur from operation of nearly emissions-free power generation by the Solar Facility, offsetting power that would otherwise be generated by the combustion of fossil fuels.
Cultural Resources	No direct or indirect impacts anticipated.	Archaeological Resources: Due to TVA's Avoidance Agreements for known NRHP-eligible and NRHP-listed sites, no impacts on archaeological resources would occur.
		Architectural Resources: Recommendation of no adverse effect on architectural resources.
Utilities	No direct or indirect impacts anticipated.	No direct or indirect adverse impacts are anticipated to utilities. The region would experience long-term benefits to electrical services.
Waste Management	No direct or indirect impacts anticipated.	With the implementation of appropriate BMPs, no impacts on waste management would be anticipated.
Public and Occupational Health & Safety	No direct or indirect impacts anticipated.	Minor, temporary impacts during construction. No public health or safety hazards would be anticipated during operation.
Transportation	No direct or indirect impacts anticipated.	Due to moderate increases from workers commuting to and from the Project Site during construction, a moderate impact on transportation would be anticipated during construction. Negligible direct impacts and no indirect impacts on transportation would occur during operation.
Socioeconomics	No direct or indirect impacts anticipated.	Short-term beneficial economic impacts would result from construction, including the purchase of materials, equipment, and services and a temporary increase in employment, income, and population. Positive, long-term, direct impacts on economics and population from Project operation. The local tax base would experience an increase from construction of the Solar Facility which would benefit Lowndes County and the Golden Triangle region of eastern Mississippi.
Environmental Justice	No direct or indirect impacts anticipated.	There would not be disproportionately high or adverse direct or indirect impacts on EPA-designated minority or low-income populations.

2.5 Best Management Practices and Mitigation Measures

MS Solar 6 would implement minimization and mitigation measures for resources potentially affected by the Project. These measures would be developed in conjunction with industry-proven BMPs, requirements of regulatory permits, and adherence to the following plans:

- Stormwater Pollution Prevention Plan
- Spill Prevention, Containment, and Countermeasures Plan, and
- Cultural and Architectural Resources Unanticipated Discovery Plan.

Additional details are provided in sub-sections 2.5.1 and 2.5.2.

2.5.1 Golden Triangle II Solar Facility

MS Solar 6 would implement the following BMPs and mitigation measures associated with potentially affected resources, as follows:

BMPs include actions to:

- Install anti-reflective, PV panel surfaces to minimize glare and reflection.
- Install silt fencing along the perimeter of areas that would be cleared, consistent with local and state stormwater regulations.
- Maintain stormwater BMPs in each area until stabilization (adequate vegetation regrowth) has been achieved.
- Avoid direct impacts on perennial and intermittent streams by maintaining a riparian buffer at most perennial and intermittent streams and jurisdictional wetlands.
- The construction contractor would monitor the weather forecast for major rain events (greater than ½ inch in 24 hours). If major rain events are predicted, construction equipment would not be stored overnight within the floodplain.
- Temporary laydown areas, construction trailers, and parking areas would be placed outside the floodplain during construction.
- Plant or seed with noninvasive vegetation and include native and naturalized plant species to encourage beneficial habitat, reduce erosion, and limit the spread of invasive species.
- Utilize vegetation that benefits pollinator species to the extent practicable.
- Utilize timer- and/or motion-activated downward facing security lighting to limit attracting wildlife, such as migratory birds and bats.
- Use dust mitigation activities such as watering dry exposed soils, covering open-body trucks, and establishing a speed limit to minimize fugitive dust.
- Install temporary construction fencing around natural resources that should be avoided.

Mitigation Measures include:

- Should traffic flow become a problem, consider implementation of staggered worker shifts during construction and a flag person along the roadside during deliveries that may coincide with heavy commute times to manage the flow of traffic near the Project Site.
- There are three residences within visual proximity to GT2. Where existing natural buffers are not sufficient in shielding residents from the Solar Facility, MS Solar 6 would install vegetative screening along the perimeter of the Project Site (additional information in section 3.5.2).
- For residences that are within 500 feet of an inverter, a pre-construction sound study including an ambient survey would be conducted to quantify the existing ambient environment. After the project reaches commercial operation, MS Solar 6 would measure the sound levels at residential property lines and identify any equipment that generates a Ldn sound level that exceeds 55 dBA at the property line. If there are locations where noise levels exceed that threshold, MS Solar 6 would install sound buffers (walls, fences with screening, or vegetation) to minimize the noise levels from operating equipment

2.6 The Preferred Alternative

TVA's preferred alternative for fulfilling its purpose and need is the Proposed Action Alternative. This alternative would generate renewable energy for TVA and its customers with only minor direct and indirect environmental impacts due to the implementation of BMPs and minimization and mitigation efforts, as described in Section 2.5.1 and Section 2.5.2. Implementation of the Project would help meet TVA's renewable energy goals and would help TVA meet customer-driven energy demands on the TVA system.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the importance, nature, and extent of environmental resources in their current setting at the Project Site. This chapter also provides a measure for the assessment of potential effects of the alternatives described in Section 2.0. The scope of environmental consequences assessed in this EA for the Proposed Action focuses on impacts related to the construction and operation of the proposed Solar Facility.

3.1 Land Use

This section provides an overview of the existing and surrounding land use at the Project Site. Potential impacts on land use associated with the alternatives are described below.

3.1.1 Affected Environment

The U.S. Environmental Protection Agency (USEPA) defines "land use" as the human use of land for activities such as agricultural, residential, and recreational uses (USEPA, 2020a). The Project Site is east of U.S. Hwy Alt 45 and south of Gilmer Wilburn Road in Artesia, Mississippi. Imagery data collected from the National Land Cover Database identify the Project Site as primarily cultivated crops and pastures.

The Project Site is generally flat with minor changes in elevation and ranges from approximately 225 to 250 feet above mean sea level. Elevation is generally higher in the northern portion of the Project Site south of Gilmer Wilburn Road and gets lower toward the southern portion of the Project Site near North Branch Magowah Creek. MS Solar 6 intends to maximize the use of agricultural and pasturelands to the greatest extent practicable, thus minimizing tree clearing and impacts on wetlands. Table 3-1 provides a detailed breakdown of land use and land cover within the Project Site.

Table 3-1: Land Use and Percent Cover within the Project Site

Land Use	Approximate Area (acres)	% Cover
Open Water	1.5	0.1
Developed, Open Space	5.7	0.4
Deciduous Forest	262.4	17.2
Evergreen Forest	49.2	3.2
Mixed Forest	16.9	1.1
Shrub/Scrub	15.5	1.0
Hay/Pasture	593.5	39.0
Cultivated Crops, Agriculture	494.8	27.9
Emergent Herbaceous Wetlands	1.9	0.1
Woody Wetlands	152.1	10.0
Total	**1523.6**	**100.0**

The closest town to the Project Site is Artesia, approximately one mile to the northwest of the Project boundary. Artesia has a population of approximately 425 people (City-Data, 2021). The Project Site is located about halfway between the municipalities of Columbus and Starkville, Mississippi. Columbus and Starkville have populations of 23,573 and 25,653 people, respectively (USCB, 2021c). There is one residence within the Project Site, and both are south of Gilmer Wilburn Road. The Golden Triangle Regional Airport and a variety of other industrial facilities are located northeast of the Project vicinity. The areas immediately surrounding the Project Site are similar in land use and are primarily agriculture/pasture or undeveloped.

According to historical aerial imagery and topographic quadrangle maps, the current land use of the Project Site has remained primarily undeveloped or used for agriculture/pasture with no significant land use changes in recent history. Figure 3-1 provides the land use classifications provided in the NRCS Land Use Land Cover Dataset.

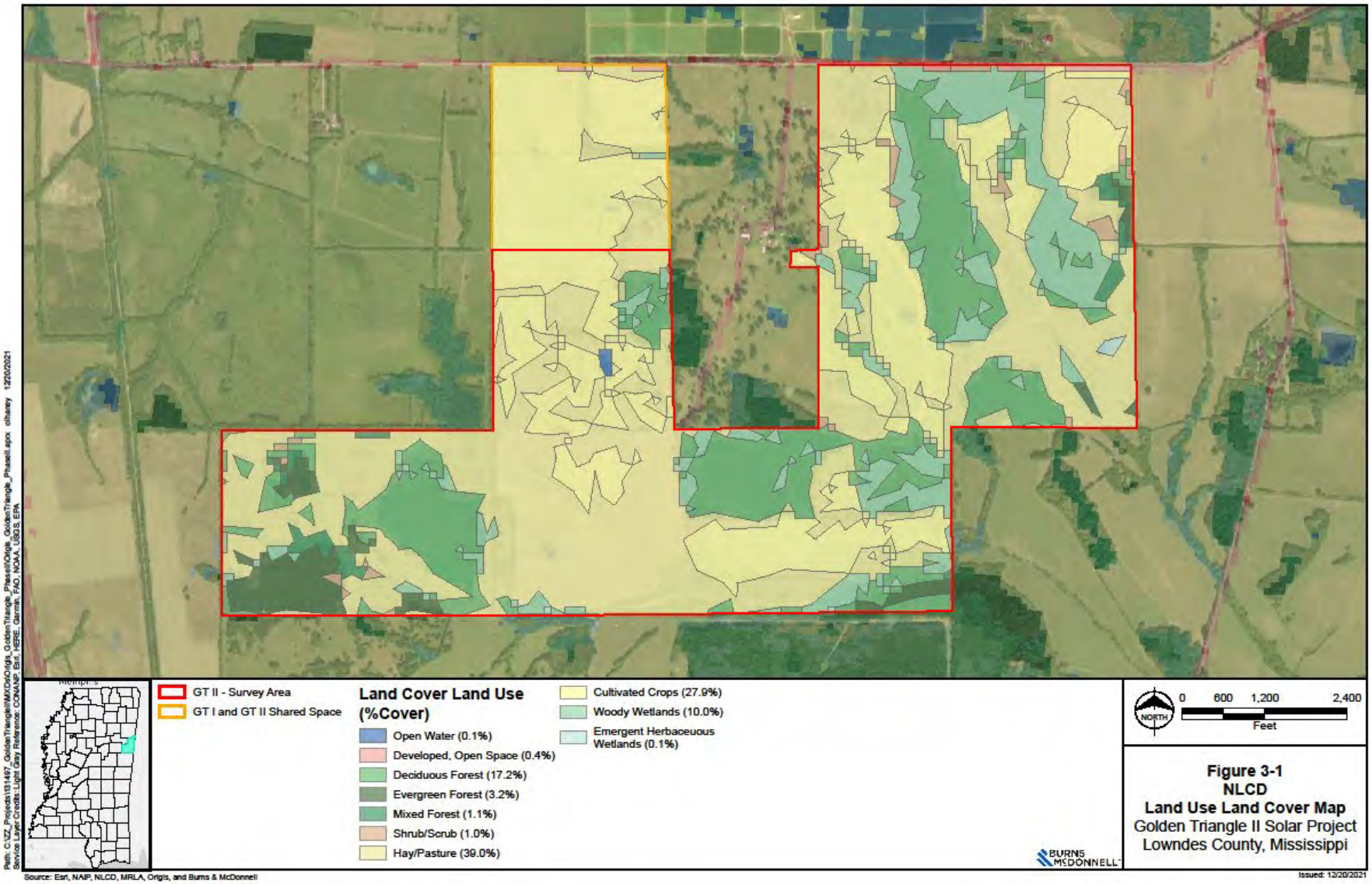


Figure 3-1: Land Cover within the Project Site

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

Under the No Action Alternative, the proposed Golden Triangle II Solar Facility would not be constructed; therefore, no Project-related impacts to land use would result. Existing land use would be expected to remain a mix of agricultural and undeveloped land for the foreseeable future.

3.1.2.2 Proposed Action

Implementation of the Proposed Action would result in construction and operation of the Solar Facility; therefore, the land use within the Project Site would change from primarily agriculture and pastureland to renewable energy production. The undeveloped forested portions of the Project Site would remain undeveloped. The undeveloped areas that are currently agricultural will remain undeveloped with no farming or other activities occurring. The Project Site is in a rural area with limited zoning restrictions and would be compatible to land uses in the surrounding areas. Golden Triangle Regional Airport is approximately three miles to the northeast of the Project Site and an approximately 1,200-acre industrial megasite facility is three miles northeast of the Project Site along with a variety of other small industrial facilities northeast of the Project Site. Installation of the Solar Facility would increase industrial development southward where agriculture is currently the dominant land use. If the Solar Facility were to be decommissioned, the land could be returned to agriculture or used for a variety of other development strategies as allowed by local zoning legislation. Minor direct impacts are anticipated from the conversion of actively cultivated agricultural land and pasture/livestock grazing land, and forested areas to solar generation.

Construction and operation of the Solar Facility is proposed in an area primarily used for agriculture and pasture. There are no outdoor recreation areas in the vicinity of the Project Site and development of the Project would not impact public recreational activities or facilities associated with recreational activities. Therefore, adverse direct or indirect impacts on land use are not anticipated.

3.2 Geology, Soils, and Prime Farmland

3.2.1 Affected Environment

This section describes the existing geological resources at the Project Site and the potential impacts on these geological resources that would be associated with the No Action and Proposed Action Alternatives. Components of geological resources that are analyzed include geology, geological hazards, paleontology, soils, and prime farmland.

3.2.1.1 Geology

The Project Site is in the Alabama and Mississippi Blackland Prairie Major Land Resource Area (MLRA) in Northeast Mississippi. This Project Site is in the East Gulf Coastal Plain section of the

Coastal Plain Physiographic Province (NPS 2018). The Coastal Plain Province is generally underlain by poorly consolidated clastic rocks from the Mesozoic and Cenozoic (Jurassic to Quaternary) age.

3.2.1.2 Geological Hazards

Geological hazards can include landslides, volcanoes, earthquakes/seismic activity, and subsidence/sinkholes. The Project Site and surrounding areas are relatively stable without significant slopes within several miles, mitigating potential risk for landslides. There are no volcanoes within several hundred miles of the Project Site (U.S. Geological Service [USGS] 2019).

Sinkholes can be common when subsurface rock composition is evaporite rock (salt, gypsum, and anhydrite) and carbonates (limestone and dolomite) which can naturally be dissolved by groundwater circulating through them. When rock dissolves, spaces and caverns develop underground. These types of formations are referred to as karst topography. Land over sinkholes may stay intact until there is not enough support for the land above the spaces. Then, a collapse of the land surface can occur. Land collapses can vary greatly in size and shape (USGS, 2016). Human activities can also expedite cavity formation in more susceptible materials and trigger a collapse or collapse an existing sub-surface cavity site. A geotechnical survey will be performed within the Project Site to determine that no carbonate bedrock units underlie the Project Site.

Surface faulting, ground motion and deformation, liquification, and subsidence as a result of seismic activity were assessed at the Project Site. Susceptibility of structures or humans to experience seismic activity are often shown via the Modified Mercalli Scale. Values on the Mercalli scale are translated into a peak ground acceleration (PGA) value to measure the maximum force experienced. The PGA is the maximum acceleration experienced by a building or object at ground level during an earthquake on uniform, firm-rock site conditions. The PGA is measured in terms as a percentage "g," the acceleration due to gravity. The USGS Earthquake Hazards Program publishes seismic hazard map data layers that display the PGA with ten percent (one in 500-year event) probability of exceedance in 50 years. The potential ground motion for the Project Site is 0.1 g, for a PGA with a two percent probability of exceedance within 50 years (USGS 2014). A 0.1 g earthquake will have a weak to moderate perceived shaking with a low moderate potential for structural damage. The Project Site has a low to moderate risk for earthquakes that will cause structural damage (USGS 2019a).

3.2.1.3 Paleontology

There are no Precambrian rocks in the Project Site because the land that is now the State of Mississippi did not exist during this period. During the Paleozoic Era, Mississippi was primarily under the sea and provided habitat to organisms such as mollusks, crinoids, brachiopods, and trilobites. As water levels receded, broad coastal plains remained, and by the end of the Paleozoic era the entire state of Mississippi would have been above sea level and exposed to erosional pressures. Rocks deposited during flooding of the late Mesozoic Era can potentially contain fossils of invertebrates, vertebrates, and driftwood. Fluctuating sea levels from glacial influence on

climate during the Cenozoic Era provided layers of windblown loess eroded from the Mississippi River to cover a large portion of the state to the northwest. Fossils of mollusks, other invertebrates, and large terrestrial mammals have been recovered from the loess deposits (Paleontology Portal, 2020).

3.2.1.4 Soils

There are 12 soil map units within the Project Site, as identified in the USDA NRCS geospatial data for Lowndes County. Each type is listed along with its percent coverage in the table below. The soil map units are illustrated in Figure 3-2. Brooksville silty-clay, Okolona silty-clay, and Vaiden silty-clay soils are considered prime farmland and Catalpa silty-clay and Leeper silty clay soils are considered prime farmland if protected from flooding or not frequently flooded during the growing season. Sumter-silty-clay-loam soils are considered farmland of statewide importance. Prime farmland and farmland of statewide importance are discussed further below.

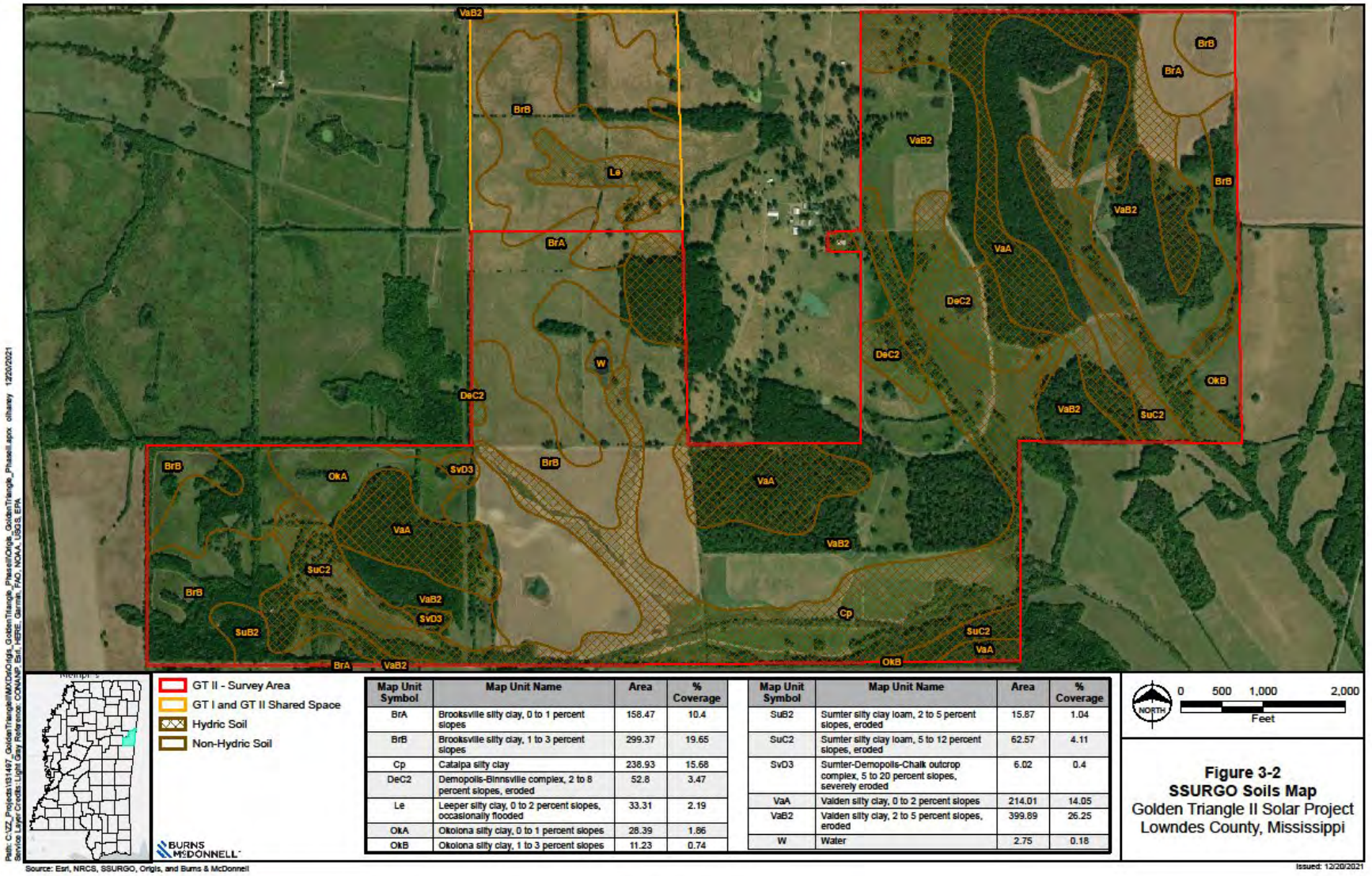
Table 3-2: Soils within the Project Site

Soil Map Unit	Farmland	Hydric	Area (acres)	Percent
Brooksville silty clay, 0 to 1 percent slopes	All areas are prime farmland	*Not Hydric*	158.5	10.4%
Brooksville silty clay, 1 to 3 percent slopes	All areas are prime farmland	*Not Hydric*	299.4	19.6%
Okolona silty clay, 0 to 1 percent slopes	All areas are prime farmland	*Not Hydric*	28.4	1.9%
Okolona silty clay, 1 to 3 percent slopes	All areas are prime farmland	*Not Hydric*	11.2	0.7%
Vaiden silty clay, 0 to 2 percent slopes	All areas are prime farmland	Hydric	214.0	14.0%
Vaiden silty clay, 2 to 5 percent slopes, eroded	All areas are prime farmland	*Not Hydric*	399.9	26.2%
Sumter silty clay loam, 2 to 5 percent slopes, eroded	Farmland of statewide importance	*Not Hydric*	15.9	1.0%
Sumter silty clay loam, 5 to 12 percent slopes, eroded	Farmland of statewide importance	Hydric	62.6	4.1%
Demopolis-Binnsville complex, 2 to 8 percent slopes, eroded	Not prime farmland	Hydric	52.8	3.5%
Sumter-Demopolis-Chalk outcrop complex, 5 to 20 percent slopes, severely eroded	Not prime farmland	Hydric	6.0	0.4%
Water	Not prime farmland	NA	2.8	0.2%
Leeper silty clay, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	Hydric	33.3	2.2%

Soil Map Unit	Farmland	Hydric	Area (acres)	Percent
Catalpa silty clay	Prime farmland if protected from flooding or not frequently flooded during the growing season	Hydric	238.9	15.7%
		Total	**1,523.6**	**100%**

Source: NRCS 2021

The Project Site is located within MLRA-135A (Alabama and Mississippi Blackland Prairie). Therefore, upland soils exhibit a low chroma matrix, which is characteristic of the native parent material and is not necessarily caused by extensive soil saturation. The Leeper soil series is typically found in floodplains of MLRA-135A and consists of very deep, somewhat poorly drained soils. These soils have dark grayish brown "A" and "B" horizons and are derived from clayey alluvium parent material. The Vaiden soil series is typically found in uplands and old stream terraces of MLRA-135A and consist of very deep somewhat poorly drained, very slowly permeable soils that formed in clayey sediments over chalk or calcareous clays. These soils have yellowish brown "A" and "B" horizons and are principally used for cropland, pasture, hay production and woodland. The Catalpa soil series is also typically found in floodplains or low terraces of streams that drain areas of MLRA-135A. The Catalpa series soils are somewhat poorly to moderately well drained and derived from clayey alluvial sediments. These soils have color ranging from a very dark grayish brown "A" horizon to a dark grayish brown and olive brown "B" horizon. The Okolona series soils are deep, well drained very slowly permeable soils found in upland areas of MLRA-135A. These are generally level to gently sloping soils derived from calcareous clayey parent material underlain by marly clay and chalk. These soils have color ranging from a very dark grayish brown "A" horizon to olive "B" horizon. The Brooksville soil series are deep, somewhat poorly drained soils found in uplands of MLRA-135. Brooksville soils have an "A" horizon that is very dark grayish brown to dark olive gray and a dark grayish "B" horizon (USDA, 2018).



Map Unit Symbol	Map Unit Name	Area	% Coverage
BrA	Brooksville silty clay, 0 to 1 percent slopes	158.47	10.4
BrB	Brooksville silty clay, 1 to 3 percent slopes	299.37	19.65
Cp	Catalpa silty clay	238.93	15.68
DeC2	Demopolis-Binnsville complex, 2 to 8 percent slopes, eroded	52.8	3.47
Le	Leeper silty clay, 0 to 2 percent slopes, occasionally flooded	33.31	2.19
OkA	Okolona silty clay, 0 to 1 percent slopes	28.39	1.86
OkB	Okolona silty clay, 1 to 3 percent slopes	11.23	0.74

Map Unit Symbol	Map Unit Name	Area	% Coverage
SuB2	Sumter silty clay loam, 2 to 5 percent slopes, eroded	15.87	1.04
SuC2	Sumter silty clay loam, 5 to 12 percent slopes, eroded	62.57	4.11
SvD3	Sumter-Demopolis-Chalk outcrop complex, 5 to 20 percent slopes, severely eroded	6.02	0.4
VaA	Valden silty clay, 0 to 2 percent slopes	214.01	14.05
VaB2	Valden silty clay, 2 to 5 percent slopes, eroded	399.89	26.25
W	Water	2.75	0.18

Figure 3-2
SSURGO Soils Map
Golden Triangle II Solar Project
Lowndes County, Mississippi

Figure 3-2: Soils within the Project Site

3.2.1.5 Prime Farmland

Prime Farmland is a designation assigned by the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS) that identifies soils and land that has the best combination of physical and chemical properties for producing food, feed, forage, fiber, and oilseed crops. The land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water. The Farmland Protection Policy Act ([FPPA]; 7 United States Code [U.S.C.] 4201 *et seq.*) requires federal agencies to consider the effects of their actions on prime or unique farmlands. The purpose of the FPPA is "to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses." (USDA, 2021). Table 3-2 describes the soil types and farmland classification within the Project Site. The table is representative of soils that would be affected by the preliminary array layout (shown in Figure 2-2). Locations of prime farmland soils on the Project Site are shown in Figure 3-3. Data analysis from the NRCS indicates prime farmland soils and farmland of statewide importance soils make up approximately 95% of the Project Site.

Hydric rating is an indicator of the percentage of a map unit that meets the criteria for hydric soils (USDA ND). Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Each map unit is designated as follows:

- Hydric = All of the components that make up the map unit are rated as being hydric.
- Predominantly Hydric = 66 – 99 percent of the components that comprise the map unit are rated as being hydric.
- Partially Hydric = 33 – 66 percent of the components that comprise the map unit are rated as being hydric.
- Predominantly Nonhydric = Up to 33 percent of the components that comprise the map unit are rated as being hydric.
- Nonhydric = None of the components that comprise the map unit are rated as being hydric.

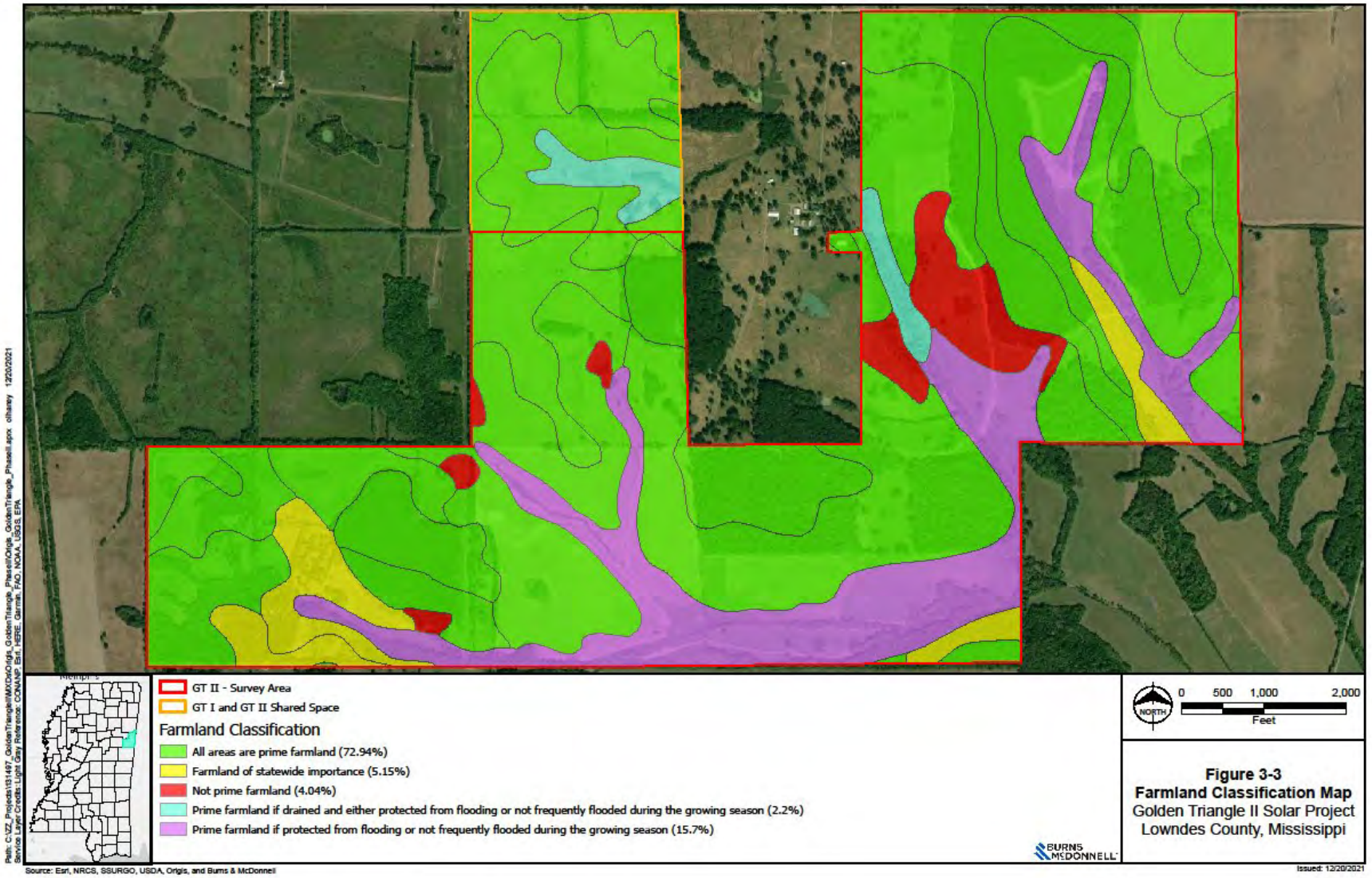


Figure 3-3: Prime Farmland Soils within the Project Site

3.2.2 Environmental Consequences

This section describes the potential impacts to Geology, Soils, and Prime Farmland from implementation of the Proposed Action or the No Action Alternative.

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed; therefore, no Project-related impacts on geology, geological hazards, paleontological, soil resources, or prime farmlands would result. Existing land use would be expected to remain as a mix of agriculture and undeveloped land. If current land use remains unchanged, impacts to soils from continued agricultural use could cause a depletion of nutrients, causing a minor change to the Project Site.

3.2.2.2 Proposed Action

Under the Proposed Action, temporary, minor direct impacts to geology and soil resources would occur from construction and operation of the Project. Minor grading and clearing for the Solar Facility would cause temporary, minor, localized increases in erosion and sedimentation, resulting in minor impacts to geology and soils.

Geology

Implementation of the Proposed Action could result in minor impacts to geology. In addition to minor grading, installation of pilings to support solar arrays would be mechanically driven to depths of up to six feet. Trenching up to approximately three feet for underground wiring connections between solar panels would also be required. Due to limited areas and potential shallow subsurface disturbances, minor direct impacts to subsurface geological resources are anticipated.

Geological Hazards

The Project Site is in an area with carbonate bedrock geology and karst landforms associated with a risk for sinkholes. Geological hazards associated with potential sinkholes will be investigated within the Project Site to ensure there are no known sinkholes anywhere within the Project Site, and the future formation of sink holes are unlikely. There is also minor to moderate potential for small to moderate intensity seismic activity. The Solar Facility would be designed to comply with applicable standards. In the unlikely event that seismic activity and/or sinkholes would occur at the Project Site, only minor impacts to the Solar Facility and associated infrastructure would occur. Impacts to resources outside of the Project Site from geological hazards associated with construction of the proposed Solar Facility are unlikely.

Paleontology

If paleontological resources are identified during initial construction or operational activities, a qualified paleontologist will be consulted to recover and analyze the resources for potential impacts. MS Solar 6 would develop and implement a recovery plan and mitigation strategy.

Soils

During construction, all soils within the Project Site could potentially be disturbed from site preparation and construction activities. In areas where vegetation or tree removal is proposed, soil would be stockpiled and replaced to the greatest extent practicable. Due to the limited vegetation and tree clearing activities likely to occur, only a nominal amount of off-site soil may be required or hauling away of on-site soil may be necessary. If other borrow material such as sand, gravel, rip rap, or other aggregate is necessary during site preparation, these resources may be used from on-site sources within the Project Site or nearby previously permitted off-site sources.

Implementation of BMPs outlined in the Erosion and Sedimentation Control Plan (ESCP) during construction, in addition to a re-vegetation strategy of planting or seeding non-invasive vegetation, including native and naturalized plant species post-construction would minimize the potential for increased soil erosion. Activities associated with construction of the Proposed Action would not result in adverse impacts to soils on the Project Site.

Minor disturbance to soils would occur during operation of the Proposed Action. Activities ranging from routine and non-routine maintenance of the arrays, array inspections, facility maintenance, fence repairs, and vegetation control would be an on-going potential disturbance to soils within the Project Site. Vegetation control would be conducted using mechanized equipment such as tractors, mowers, and trimmers. MS Solar 6 proposes to re-vegetate the Project Site with low-growing native vegetation that would reduce the routine vegetation maintenance while also limiting interference with the solar arrays. Broad application of herbicides is not anticipated. However, if selective herbicides are necessary for small applications around problematic areas, they would be applied by a licensed contractor or qualified staff. Maintenance activities discussed in this section would not result in adverse impacts to soils on the Project Site during operation.

Prime Farmland

Implementation of the Proposed Action would result in a large portion of the Project Site being developed into the Golden Triangle Solar II Facility, changing the land use to renewable energy from the existing agriculture and pastureland. Since the entire Project Site is essentially prime farmland or farmland of statewide importance, implementation of the Proposed Action would result in direct impacts to prime farmland from installation of the solar arrays and construction of permanent structures necessary for operation of the Solar Facility. Based on information provided by the local NRCS office, there is approximately 330,000 acres of farmable land in Lowndes County, of which 250,000 acres is FPPA-defined farmland. Any area within the Project Site not developed for the Solar Facility would likely remain undeveloped. Depending on the size of undeveloped agricultural areas within the Project Site, MS Solar 6 may allow certain landowners to resume agricultural activities if they are interested. Based on the availability of farmable land in Lowndes County, the Project would not result in an adverse impact on agriculture.

During site preparation and grading activities, topsoil would be stockpiled and re-applied to the respective surface areas once grading is complete. Soils within the Project Site do not have characteristics that would require specific construction requirements or techniques. If the Solar

Facility is decommissioned and closure occurs, facility components would be removed, and farming could subsequently be resumed with limited long-term loss of agriculture production.

Implementation of the Proposed Action would result in temporary adverse effects to prime farmland during operation of the Solar Facility. Stockpiling topsoil for reuse and installing appropriate erosion control devices would preserve topsoil at the Project Site. Adhering to BMPs during construction and operation of the Solar Facility and revegetating the site with native plant cover would limit erosion. Implementation of these BMPs would result in minor impacts to prime farmland. If the Solar Facility is decommissioned and Project equipment is removed, the Project Site could be returned to agricultural, and pastureland uses with a negligible loss to soil productivity. Beneficial impacts to soil health could result from a re-vegetation strategy using native and non-invasive species while terminating the need for broad application of herbicides, pesticides, and fertilizers. Based on the above mitigation measures as well as the availability of farmable land in Lowndes County, impacts on prime farmland soils would be minor and mostly reversible.

3.3 Water Resources

This section provides an overview of existing water resources in the Project Site, and the potential impacts on these water resources that would be associated with the No Action and Proposed Action Alternatives. Water resources discussed in this section include groundwater and surface water, including wetlands and floodplains.

3.3.1 Affected Environment

3.3.1.1 Groundwater

Groundwater supplies more than 38 percent of water needs for public water supply, agriculture, industry, mining, thermoelectric power, and domestic and commercial use in the Arkansas, Louisiana, and Mississippi area, which encompasses Lowndes County (Segment 5 of the Ground Water Atlas of the United States). In Mississippi, groundwater provides approximately 68 percent of the freshwater used in the state, most of which is used for agriculture (USGS, 1998). In Lowndes County, approximately 8.37 million gallons per day of groundwater is withdrawn from public supply self-supplied groundwater, and an estimated 192 gallons per person per day are used (USGS 2018).

Major aquifers near the Project Site are the Southeastern Coastal Plains (Black Warrior River) aquifer system and the Mississippi embayment aquifer system. These aquifers consist primarily of an unconsolidated to poorly consolidated Coastal Plain strata of gravel, sand, clay, and some limestone of the Cretaceous and Holocene age. Specifically, the Mississippi embayment aquifer system consists of permeable sedimentary rock from the late Cretaceous to middle Eocene period and is the largest aquifer system in the Coastal Plain. In the mid-1980's, the Mississippi embayment aquifer system provided nearly six percent of the total groundwater withdrawn in Mississippi, Louisiana, and Arkansas. Large quantities of groundwater withdrawn via wells from the Coastal Plain aquifer systems during the last 100 years have not only lowered water levels,

but they have also caused encroachment of salt water, decreased thickness of several aquifers, and even altered regional groundwater flow (USGS 1998).

Prior to the development of the Coastal Plain, regional groundwater flow was primarily driven topographically from elevated interstream recharge areas on the east and west sides of the Mississippi River to discharge areas in the valleys. Groundwater in the region is generally safe for most uses and quality in the aquifers correlate with groundwater flow, depth, and principal chemical constituents. Chemical constituents in groundwater below the Project Site are calcium bicarbonate, sodium bicarbonate, and sodium chloride where areas of the aquifer are deeply buried (USGS, 1998).

3.3.1.2 Surface Water

Surface waters are defined as water features that are on the Earth's surface, typically consisting of streams, lakes, ponds, and wetlands. Surface water features are further segregated into perennial, intermittent, and ephemeral. Perennial waters are permanent surface water features that have water present throughout the year. They typically exist as streams, rivers, lakes, springs, and swamps. During periods of little or no rain, the water level is maintained by groundwater contributions. Intermittent classification is generally restricted to streams that have a well-defined channel but only contain water part of the year, typically during winter and spring seasons when the stream bed is below the water table. Intermittent streams often do not support the diversity of biological and hydrological characteristics that perennial streams do. Ephemeral waters are features that only hold water for part of the year or flow as a result of stormwater events. Ephemeral streams (also known as wet-weather conveyances) are features that only flow in direct response to preciptiation events. Flow would only occur during and shortly after large precipitation events. These features typically lack the biological, hydrological, and physical characteristics of intermittent and prennial streams. Examples ephemeral streams/drainages include topographic swales and/ or dry drainages with poor bed and bank development.

Wetlands are those areas inundated by surface water or groundwater such that vegetation adapted to saturated soil conditions is prevalent. Examples include swamps, marshes, bogs, and wet meadows. Wetland habitat provides valuable public benefits including flood/erosion control, water quality improvement, wildlife habitat, and recreation opportunities.

Surface waters that meet certain physical and hydrologic criteria (defined bed and bank, ordinary high water mark, or specific hydrologic, soil, and vegetation composition) as defined in the Clean Water Act (CWA) are considered Waters of the U.S. (WOTUS) (or jurisdictional waters) and are under the regulatory jurisdiction of USACE. The CWA is the primary federal law that regulates discharges of pollutants and/or fill materials into WOTUS as outlined in Sections 402, 404 and 401. A jurisdictional determination by the USACE typically governs the activities affecting WOTUS.

The Project is within the U.S. Environmental Protection Agency (USEPA) Blackland Prairie Ecoregion (Level 4) and is within the Middle Tombigbee River [Hydrologic Unit Code (HUC) 03160106] and Tibbee Creek (8-digit HUC 03160104) sub-basins (USGS 2021b). The northern

half of the Project Site generally drains south and west into north branch of Magowah Creek which flows in a westerly direction eventually into Magowah Creek which drains to the Tombigbee River. The North Branch of Magowah Creek, (designated use is "Aquatic Life Support") is not listed on Mississippi's 2020 303(d) List (MDEQ 2020).

3.3.1.3 Wetlands

Field surveys were conducted on March 7 through March 13, 2021, to determine the presence of potentially jurisdictional wetlands and waterbodies within a prescribed Survey Area which encompasses the more refined Project Site (Appendix B). The delineation was conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual (1987 Manual) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region – Version 2.0 (Regional Supplement).

Wetlands are those areas inundated by surface water or groundwater such that vegetation adapted to saturated soil conditions is prevalent. Examples include swamps, marshes, bogs, and wet meadows. Wetland habitat provides valuable public benefits including flood/erosion control, water quality improvement, wildlife habitat, and recreation opportunities. Appendix B contains the *Golden Triangle II Solar Project Wetland and Waterbody Delineation Report*. Environmental Field Surveys were performed over a large survey area that included almost 1,525 acres. Based on the results of the surveys, MS Solar 6 refined the site design to minimize or avoid impacts on environmental resources, most specifically wetlands, waterbodies, and habitat that could be suitable for rare, threatened, or endangered plants and animals.

Under Executive Order (EO) 11990, federal agencies shall avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands and avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. Under Section 404 of the Clean Water Act, unavoidable impacts to wetlands should be compensated through a process known as compensatory mitigation. Wetlands on the Project Site were classified by hydrologic regime and vegetation cover type in accordance with the Cowardin Classification System (Cowardin et. al. 1979). Three wetland types were identified within the Project Area: palustrine emergent (PEM; 11.89 acres), palustrine forested (PFO; 2.8 acres), and palustrine scrub-shrub (PSS; 2.49 acres) for a total of 17.18 acres of potentially jurisdictional wetlands. The common overstory and understory vegetation of PFO wetlands consists of water oak (*Quercus nigra*) sugarberry (*Celtis laevigata*), Osage orange (*Maclura pomifera*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), American sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), Chinese privet (*Ligustrum sinense*), American elm (*Ulmus americana*) and willow oak (*Quercus phellos*). Common vegetation comprising the understory includes poison ivy (*Toxicodendron radicans*), butterweed, roundleaf greenbrier (*Smilax rotundifolia*), Virginia creeper (*Parthenocissus quinquefolia*), yellow nutsedge (*Cyperus esculentus*), and soft rush (*Juncus effusus*). Typical, dominant scrub shrub species encountered during surveys included green ash, black willow (*Salix nigra*), butterweed, bulbous bittercress (*Cardamine bulbosa*), and soft rush. Species commonly found in the PEM within the Project Area included shallow sedge (*Carex lurida*), black willow, alligator weed (*Alternanthera philoxeroides*),

rough cockleburr (*Xanthium strumarium*), butterweed, annual ragweed (*Ambrosia artemisiifolia*), great ragweed (*Ambrosia trifida*) ,woolgrass (*Scirpus cyperinus*), curly dock (*Rumex crispus*), blackberries (*Rubus* spp.), spike rush (*Eleocharis palustris*), yellow nutsedge, and soft rush.

3.3.1.4 Floodplains

Floodplains are geographic areas that FEMA has defined according to varying levels of flood risk and type of flooding. The area subject to a one-percent chance of flooding in any given year is normally called the 100-year floodplain. The area subject to a 0.2-percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in floodplains to ensure that the Project is consistent with the requirements of EO 11988, Floodplain Management. A review of FEMA's NFHL indicates the southern portion and a narrow area associated with S-16 on the easternmost parcel of the Project Site is within a 100-year floodplain (Zone A/AE) (Figure 3-4). The floodplain is predominately associated with the North Branch of Magowah Creek, which flows along the southern boundary of the Project Area. Maps developed by FEMA show the likelihood of flooding in particular areas and help determine eligibility for the National Flood Insurance Program (NFIP). The purpose of the NFIP is to reduce impacts from flooding to private and public structures by supporting community level regulations to mitigate the effects of flooding to structures (FEMA 2021a). Lowndes County participates in the NFIP. EO 11988, Floodplain Management, requires federal agencies "to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative…" The following floodplain/floodway requirements have been previously established by Lowndes County for the Project Site:

> Floodplains: Lowndes County requires that an elevation certificate be submitted for each individual solar panel tracking string. The elevation certificate must demonstrate that the lowest section of the module, at full tilt, is at least one foot above the 100-year base flood elevation.
>
> Floodways: Lowndes County requires that a no-rise condition be reflected through hydraulic analysis in order to avoid the requirement of a Conditional Letter of Map Revision (CLOMR). If a no-rise condition cannot be met, a CLOMR must be obtained as the best mitigation approach to prevent major impacts on flood heights.

There are no FEMA Regulatory Floodways associated with GT2.

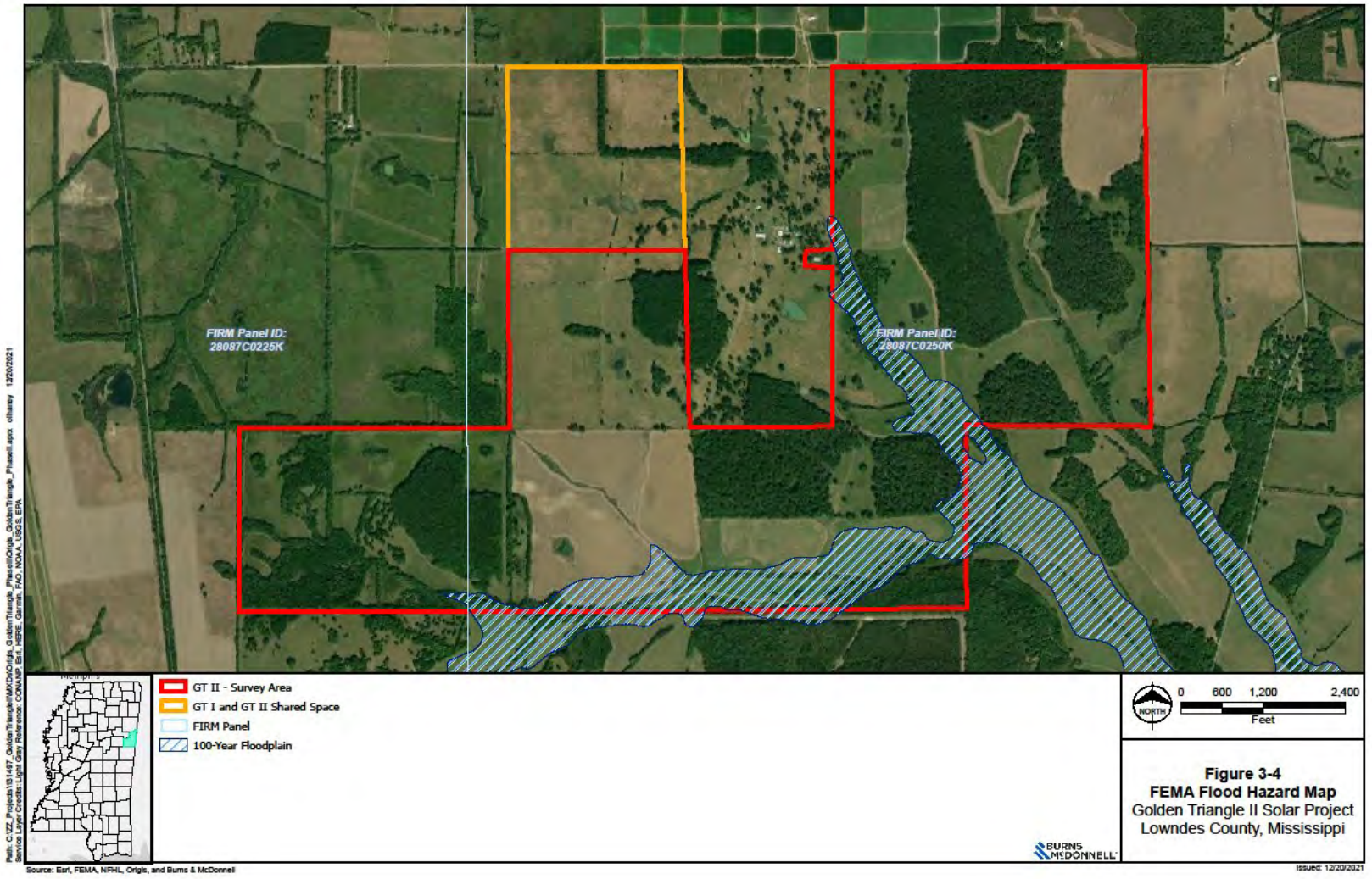


Figure 3-4: Floodplains within the Project Site

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed; therefore, no Project-related impacts on water resources would occur. Existing land use would remain as farmland and surface waters would remain as they are at the present time. Increases in erosion and sediment runoff could occur over time if best-practices in agriculture were not maintained to prevent erosion and runoff. In addition, if broad applications of chemical fertilizers or pesticides are continually used, this could result in nutrient-rich runoff that degrades the quality of surface waters within the site and throughout the broader drainage basin.

3.3.2.2 Proposed Action

Under the Proposed Action, minor short-term impacts from construction would be expected on streams, wetlands, and floodplains from sedimentation of exposed soils. Standard BMPs would be installed, inspected, and maintained until satisfactory stabilization is achieved. Beneficial, indirect impacts to surface water and groundwater would result from a reduction in broad applications of pesticides, herbicides, and fertilizers used in support of the current agricultural land use activities. Additionally, water quality may be improved through filtering by native plant cover as opposed to crop cover, which could reduce erosion and sedimentation from stormwater events.

Groundwater

During construction, hazardous materials would be on-site that could potentially contaminate groundwater resources, including petroleum products for fuel and lubrication of construction equipment, hydraulic fluids, and a variety of other chemicals commonly used for general construction projects. Implementation of BMPs would provide measures to minimize potential for leaks or spills from construction equipment and outline procedures and protocols to quickly address potential spills that may occur. Construction activities would be in accordance with BMPs outlined in TVA's *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017b) to avoid contamination to groundwater. Fertilizers and herbicides are not proposed to be used during construction or operation of the Proposed Action which would be considered a direct long-term benefit to groundwater. However, if minor application of fertilizer is needed for initial re-vegetation, applications would be in accordance with the manufacturer's recommendation and would be short-term. Currently, most of the land proposed for use is actively cultivated cropland with frequent application of fertilizers, herbicides, and pesticides. Change in land use from agriculture to solar would be a long-term beneficial impact to groundwater.

Water needed for construction would be provided from existing or proposed temporary groundwater wells or water delivery trucks. The construction contractor would use water for the purposes of fugitive dust mitigation (during dry conditions), concrete mixtures, and other temporary construction needs. If practicable, groundwater wells and holding tanks would reduce

and avoid impacts to groundwater. Construction activities requiring water would primarily be for dust control and compaction during grading activities for access roads, pads, and foundations for structures.

Water usage within the Project Site during operations would be in accordance with BMPs outlined in TVA's *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities.* Local rainfall is generally consistent enough to avoid the need for dust control on PV arrays. Therefore, regular panel washing is not anticipated. Water needs during the operation and maintenance phase of the Proposed Action, would be addressed by new or existing groundwater wells. Groundwater withdrawal volumes are expected to be less than the existing volume needed for agricultural irrigation, thus resulting in a net positive impact on groundwater resources.

Broad application of fertilizers and herbicides are not proposed during construction or operation of the Project, which would be considered a direct long-term benefit to groundwater. However, if minor applications of fertilizer or herbicides are needed for initial re-vegetation or maintenance, applications would be in accordance with manufacturer's recommendations and would be short-term. Currently, most of the land proposed for use is actively cultivated cropland with frequent application of fertilizers, herbicides, and pesticides. Change in land use from agriculture to solar would therefore be a long-term beneficial impact to groundwater.

If the Solar Facility were to be decommissioned or closed, a Decommissioning and Closure Plan would be developed. The Decommissioning and Closure Plan would detail procedures to control erosion and sedimentation and maintain compliance with NPDES requirements and permits. Water usage for potential decommissioning and closure is not likely to exceed that used for operation and maintenance. Therefore, impacts to groundwater resulting from a decommissioning and closure of the Solar Facility are not anticipated.

There were no sinkholes identified within the Project Site, therefore the potential for direct surface to groundwater contamination from stormwater or chemical and solid waste runoff is not anticipated. Herbicide and pesticide applications are not expected to be used during construction or operation of the Project. However, if pesticides or herbicides would be required at any point during construction or maintenance activities, applications would be consistent with Mississippi Department of Agriculture and Commerce permit requirements. Proper application of herbicides and pesticides, if needed, may result in minor impacts to surface water but would be significantly less than applications from current land use.

Overall, impacts to local aquifers and groundwater are not anticipated due to the limited volume of groundwater required for initial construction, operation, and maintenance, or decommissioning and closure of the Solar Facility. BMPs and a Decommissioning and Closure Plan would reduce the potential for hazardous materials to reach groundwater resources during any stage of the Project.

Additionally, minor, indirect beneficial impacts to groundwater could occur from the discontinued use of broad applications of herbicides, pesticides, and fertilizers, due to change in land use from agriculture to solar.

Surface Water

Due to capacity requirements and land constraints, complete avoidance of jurisdictional water features was not practicable with the Proposed Action. Due to the need to cross certain streams within GT2, temporary and permanent access road crossings would be necessary. The installation of temporary and permanent bridges and/or culverts could affect up to 300 linear feet of intermittent and perennial streams. During all stages of the design process, efforts have been made to avoid and minimize impacts to jurisdictional wetlands and waterbodies to the greatest extent practicable. New stream crossings would, to the extent practicable, occur at a 90-degree angle to the stream. Best Management Practices for stream crossings would be implemented, such as using a bridge span that avoids direct impacts to the stream beds and top of bank, placing geotextile fabric along bridges to minimize dirt and debris from entering the stream channel, and minimizing the width of each crossing to the smallest width allowable (within safety requirements).

The layout of PV panels, access roads, inverters, and other related Project components have not been finalized. MS Solar 6 would design the final layout so that panel placement would avoid impacts on streams and wetlands. However, some linear Project components, such as tie-in lines and access roads would require a minimal number of stream crossings. The Proposed Action would result in minor, direct, permanent impacts to jurisdictional streams at locations where permanent culverts are installed for construction of access roads. The linear feet of culvert installation in total would not exceed 300 feet. While complete avoidance of stream features was not possible, with implementation of the above mentioned BMPs, the USACE and MDEQ Section 404 and 401 permit requirements, and the Project's MDEQ-approved SWPPP to control erosion and sediment runoff, impacts to streams would be short-term and minimal.

Table 3-3 provides a breakdown of potential impacts on streams due to facility access road crossings. Currently, MS Solar 6 anticipates the need for eight stream crossings, totaling approximately 160 linear feet of impacts. The exact crossing location along these streams is still preliminary; however, best management practices, such as keeping bridges or crossings to a 90-degree angle and utilizing existing bridges when available, would be implemented. MS Solar 6 intends to limit stream crossings to 300 total linear feet (or less) in order to comply with the USACE and MDEQ impact limits under NWP 3 and/or NWP 14. Existing access roads and bridges would be prioritized with construction of new waterbody crossings and culvert installation only being used where necessary.

Table 3-3: Waterbodies Potentially Affected by the Golden Triangle II Solar Project Access Road Crossings

Waterbody ID	Waterbody Type	Top of Bank Width (feet)	Length of Stream (feet) in Project Site	Impact Type	Length of Impact (feet)	Area of Impact Sq. ft.
S-29	Intermittent	5	3,430	bridge/culver	20	100
S-05	Perennial	5	4,243	bridge/culver	20	100
S-16	Perennial	20	11,766	bridge/culver	20	400
S-16	Perennial	20		bridge/culver	20	400
S-33	Perennial	6	4,837	bridge/culver	20	120
S-33	Perennial	6		bridge/culver	20	120
S-23	Perennial	25	2,790	bridge/culver	20	500
S-21	Intermittent	2	378	bridge/culver	20	40
				Total Impact	**160**	**1780**

Wetlands

Impacts on wetlands would be avoided to the extent practicable. As the current layout shows, the area of impact has been designed to avoid any impacts on wetlands entirely. The placement of permanent aboveground facility components, such as PV panels, inverters, and access roads were limited to upland areas. Minor impacts from stormwater discharges could occur to wetlands within the Project Site. However, buffers of at least 15 feet have been established around wetlands; and BMPs such as silt fencing would be installed, inspected, and maintained along the perimeter of the construction area where wetlands are present. In some cases, buried tie-in lines may be required to connect one area of panels to another. To avoid disturbances to wetland features at the Project Site, MS Solar 6 would bore under wetlands as necessary to install collection cables. If a wetland crossing were identified by the construction contractor, the appropriate permits and clearances would be obtained through the USACE Mobile Regulatory District and the Mississippi DEQ. Figure 3-5 shows the preliminary array layout and delineated features within the Project Site. As shown, MS Solar 6 would avoid jurisdictional wetlands and waterbodies to the greatest extent practicable.

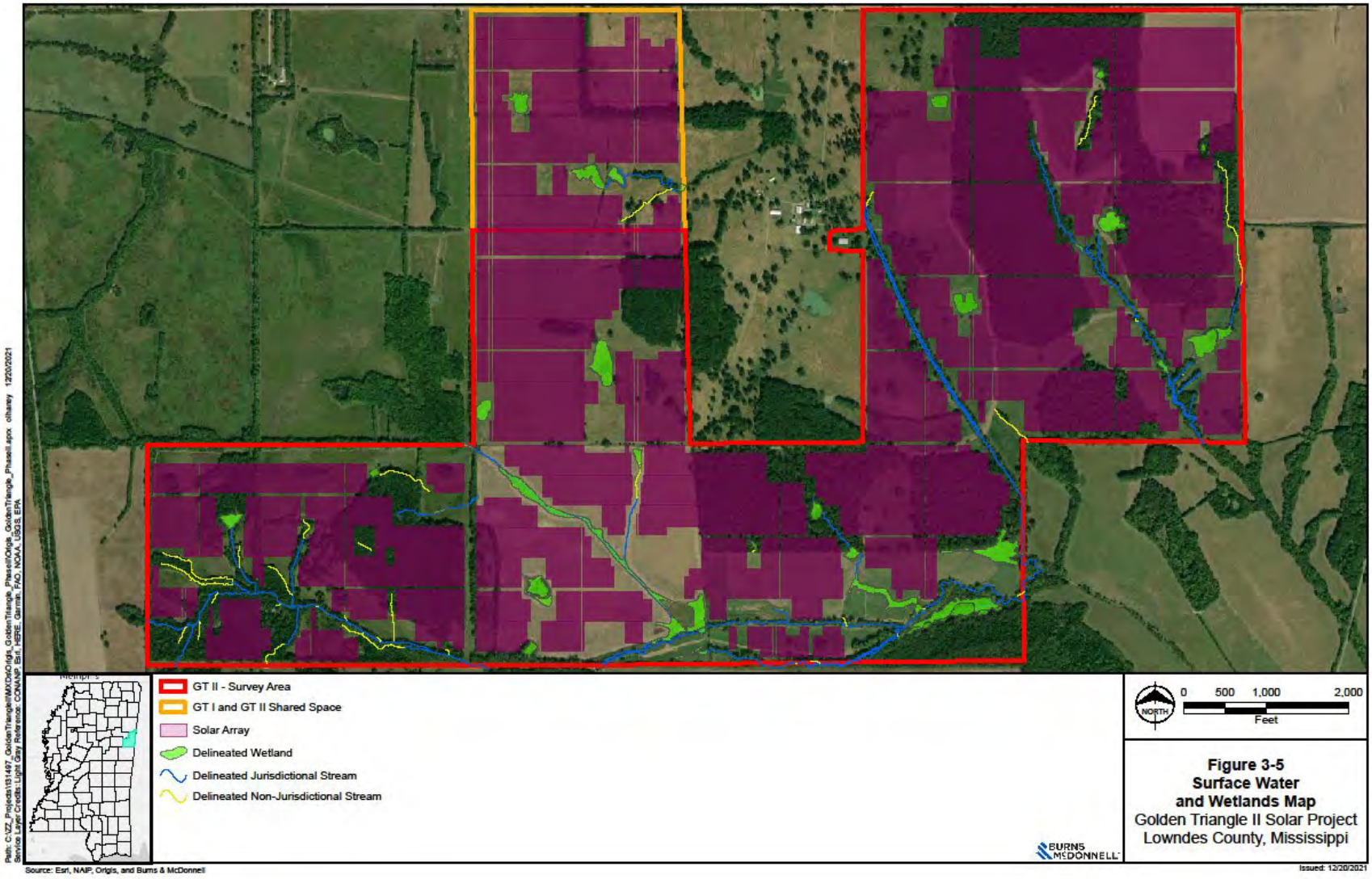


Figure 3-5: Surface Water and Wetlands within the Project Site

Floodplains

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "… to avoid to the extent practicable the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative…" The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent government policy against such development under most circumstances (United States 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

Approximately 135 acres of floodplain were identified within the Project Site. As depicted in Figure 2-2, the preliminary layout of solar arrays has been designed to minimize the number of PV panels installed within floodplains. However, a small section of arrays would be installed within the floodplain. The location of arrays within the floodplain was determined based on the results on MS Solar 6's Hydrology Study (Appendix C).

Project components, such as buried collection lines, a small percentage of PV panels, security fencing, security lighting, and portions of the overhead wire may occur within the 100-year floodplain, which is currently utilized for active agricultural operations. Consistent with EO 11988, the installation of underground electric lines and fencing are considered to be repetitive actions in the 100-year floodplain, which would result in minor impacts (TVA 1981).

During construction, the temporary laydown areas, construction trailers, and parking areas would be placed outside the floodplain. Additionally, the construction contractor would monitor the weather forecast; and, if a heavy rain event (greater than ½ inch) is predicted, construction equipment would not be stored overnight within the floodplain.

MS Solar 6 would need new access roads throughout the Solar Facility in order to access arrays and inverters during construction and operation. MS Solar 6 would utilize existing farm roads to the greatest extent practicable. The exact location of any new compacted earth access roads is not yet final. However, it is anticipated that at least one new access road would be needed within the 100-year floodplain. MS Solar 6 has discussed with Lowndes County the potential Project activities within the 100-year floodplain. Lowndes County participates in the National Flood Insurance Program, and any development must be consistent with its floodplain regulations. Prior to construction, a review by the Lowndes County Floodplain Administrator would occur; and the appropriate permissions would be obtained for work and facilities within the floodplain. Any access roads would be designed and permitted as compacted earth facility roads. Panels would be placed at a height that would allow the lowest point to occur at least one foot above the BFE (base flood elevation; based on the Hydrology Study for the Project Site). Impacts on the floodplain are anticipated to be minor.

To minimize adverse impacts if the Solar Facility is dismantled at the end of its useful life, non-recyclable and/or non-reusable debris would be disposed of at an appropriate location outside 100-year floodplains.

3.4 Biological Resources

This section provides an overview of the existing biological resources within the Project Site and the potential impacts to those resources from implementation of the No Action and Proposed Action Alternatives. Biological resources analyzed in this section include natural areas, vegetation, wildlife, and rare, threatened, and endangered species.

The Project is within the U.S. Environmental Protection Agency (USEPA) Blackland Prairie Ecoregion (Level IV) and is within the Middle Tombigbee River [Hydrologic Unit Code (HUC) 03160106] and Tibbee Creek (HUC 03160104) watersheds. Blackland prairie ecoregions usually consist of gently rolling hills with little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon geradii*), Indianagrass (*Sorghastrum nutans*), eastern gamma grass (*Tripsacum dactyloides*), switchgrass and sidesoats grama (*Bouteloua curtipendula*) with sparse pockets of pecan (*Carya illinoinensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), and a variety of oak trees (*Quercus sp.*). Average temperatures are usually between 66- and 70-degrees Fahrenheit and rainfall averages 30 to 40 inches annually (Texas Parks and Wildlife, 2021). Agriculture products such as corn, soybeans, and hay are produced in large quantities within the Project Site and surrounding area.

Prior to conducting field work, Burns & McDonnell biologists reviewed the USFWS Information for Planning and Consultation (IPaC) for the Project Area (Appendix D), regarding special status species that may occur within the Project Site (Consultation Code: 04EM1000-2021-SLI-0745, Event Code: 04EM1000-2021-E-01680) and assessed whether the proposed Project had potential to affect ESA species (i.e., ESA listed, proposed and candidate species), bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), migratory birds (including raptor species), and associated habitat within the Survey Area. Additionally, consultation was conducted with Mississippi Department of Wildlife, Fisheries, and Parks' (MDWFP) National Heritage Program which provided a list of state protected species and state ranked species of special concern with potential to occur within two miles of the Survey Area. U.S. Fish and Wildlife's Range Wide Indiana Bat Survey Guidelines (USFWS, 2019) was also reviewed. Lastly, TVA's regional Natural Heritage Database was reviewed which provides known occurrences of rare species within three and five miles of the Project Site for terrestrial and botanical species, respectively.

Field surveys were conducted from March 7 - March 13, 2021. During the field surveys, data was collected on vegetative cover/land use and protected species habitats. Regulations for biological resources potentially relevant for the Proposed Action include:

- Endangered Species Act (ESA) (16 U.S.C. §§ 1531-1544).
- Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712) (for actions of nonfederal entities).

- Executive Order for Migratory Birds (EO 13186 of January 10, 2001) (for actions of federal agencies).
- Bald and Golden Eagle Protection Act (BGEPA); and
- Mississippi Nongame and Endangered Species Conservation Act (Miss Code Ann. § 49-5-101 to 49-5-119).

Additionally, TVA provided data from the regional Natural Heritage Database (RNHD) for federal and state protected species occurring within or near the Project Site or generally listed for Lowndes County, MS.

3.4.1 Affected Environment

Biological resources within the Project Site include natural areas, vegetation, wildlife, and the potential for rare, threatened, or endangered species.

3.4.1.1 Natural Areas

Natural areas include managed areas such as Wildlife Management Areas, National Wildlife Refuges and Habitat Protection Areas, ecologically significant sites, and river segments listed in the Nationwide Rivers Inventory. There is only one natural area within three miles of the Project. The closest natural area to the Project Site is the Black Prairie Wildlife Management Area, which is approximately 2.1 miles to the southeast (MDWFP 2022). The Black Prairie Wildlife Management Area, is managed and maintained by MDWFP, and is used primarily for deer hunting and wildlife viewing.

3.4.1.2 Vegetation

The Project Site is located within the Black Belt Prairie (also known as the “Blackland Prairie” and the “Cotton Belt”), which is a subdivision of the East Gulf Coastal Plain physiogeographic province. The Black Belt Prairie is best known for its dark, low chroma soils and high crop yield; however, prior to the influx of farming practices, there were three dominant plant communities that naturally occurred in this region: open prairie, chalk outcrop, and forests (MacGown, Brown, and Hill 2006). Naturally occurring, mature hardwood forests are found within and beyond the Project Site.

Figure 3-6: Chalk Outcrop on Parcel Associated with the Project



Chalk outcrops occur in areas within the Black Belt Prairie where erosion has exposed the underlying formation. Two outcrops were identified within a parcel of land that would be leased to MS Solar 6 as part of the Project Site. These scattered outcrops, which have undergone severe erosion, add up to approximately 12 acres in total. Chalk outcroppings are known to support several endemic and rare species of plants and insects. The photo to the left in Figure 3-6 was taken within the Project Site in March 2021. Most of the Project Site on the south side of Artesia Road are within part of a prairie that is now in use as pastureland for cattle grazing (Phillips 2012). Very little undisturbed prairieland still exists today due primarily to human disturbances such as agricultural practices, conversion to pastureland for livestock, and other developments (Phillips 2012).

There are presently three major vegetation communities currently within the Project Site: active agriculture (row crops and pastureland), bottomland hardwood forests, and upland forests.

More than half of the Project Site is comprised of pastureland and approximately 9 percent is agricultural fields. Vegetation in these communities is maintained in an early successional state due to herbicide application, crop growth/harvesting, and cattle grazing. Corn is planted in late spring and cover the row crop fields. Vegetation observed in pastures consists of primarily tall fescue grass (*Festuca arundinacea*), Johnson grass (*Sorghum halepense*), annual bluegrass (*Poa annua*), couch grass (*Elymus repens*), bermuda (*Cynodon dactylon*), annual ragweed (*Ambrosia atemisiifolia*), cheatgrass (*Bromus tectorum*), perennial ryegrass (*Lolium perenne*), green foxtail (*Setaria viridis*), butterweed (*Packera glabella*), bulbous bittercress, soft rush, Cherokee sedge (*Carex cherokeensis*), fox sedge (*Carex vulpinoidea*), red sorrel (*Rumex acetosella*), curly dock, prairie fleabane (*Erigeron strigosus*) , jimsonweed (*Datura stramonium*), Carolina horsenettle (*Solanum carolinense*), bull thistle (*Cirsum vulgare*), wild violet (*Viola sororia*), field garlic (*Allium vineale*), and sensitive partridge pea (*Chamaecrista nictitans*).

Bottomland hardwood forests are also present within the Project Site. These communities are composed of a tree canopy associated with a mature second-growth forest. Dominant vegetation observed consisted of water hickory (*Carya aquatica*), willow oak, cherrybark oak (*Quercus pagoda*), swamp chestnut oak (*Quercus michauxii*), silky dogwood (*Cornus amomum*), osage orange, green ash, eastern red cedar (*Juniperus virginiana*), water locust, shagbark hickory (*Carya ovata)*, box elder (*Acer negundo*), red maple, American sycamore (*Platanus occidentalis*), sugarberry, Cherokee sedge, wild petunia (*Ruellia humilis*), tall fescue, poison ivy, greenbrier, Virginia spiderwort (*Tradescantia virginiana*), Virginia creeper, hairy buttercup (*Ranunculus sardous*), and resurrection fern (*Pleopeltis polypodioides*),

The upland forests within the Project Site are also mostly composed of a canopy age associated with a mature second growth forest. Dominant vegetation observed consisted white oak (*Quercus alba*), southern red oak (*Quercus falcata*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), mockernut hickory (*Carya tomentosa*), shagbark hickory, pignut hickory (*Carya glabra*), loblolly pine (*Pinus taeda*), eastern red cedar, American elm (*Ulmus americana*), honey locust (*Gleditsia triacanthos*), osage orange, Chinese privet, Devil's walkingstick (*Aralia spinosa*), Christmas fern (*Polystichum acrostichoides*), Japanese honeysuckle (*Lonicera japonica*), multiple greenbrier species (*Smilax spp*.), muscadine (*Vitis rotundifolia*.), Virginia creeper, blackberry (*Rubus spp*.), wooly panic grass (*Dichanthelium acuminatum*), and wild violet. The upland forest in the southwest corner of the Project Site is primarily composed of eastern red cedar.

3.4.1.3 Wildlife

Surveys for protected species and habitat assessments were conducted from March 7 through March 13, 2021. The entire Project Site was surveyed simultaneously during the wetland delineation survey. In addition to habitat assessment, detailed vegetative communities were described. Areas within the Project Site that are not currently used for agriculture may provide suitable habitat for wildlife common to the region both seasonally and year-round.

Mammals commonly found throughout Mississippi include coyotes (*Canis latrans*), white-tailed deer (*Odocoileus virginianus*), otters (*Lontra canadensis*), beavers (*Castor canadensis*), black bears (*Ursus americanus*), skunks (*Mephitis mephitis*), opossums (*Didelphis virginiana*), racoons (*Procyon lotor*), squirrels (*Sciurus* spp.), and armadillos (*Dasypus novemcinctus*) (MDWFP 2021). During field surveys for protected species and habitat assessments, evidence of deer, raccoon, squirrel, opossum, and armadillo were physically observed and generally confined to the forested areas. Observations of deer and deer tracks were made throughout the site.

Reptiles and amphibians commonly found in the region include a variety of turtles, lizards, frogs, and snakes. Fence lizards (*Sceloperus* spp.), five-lined skinks (*Plesitiodon fasciatus*), and anoles (*Anolis* spp.) are commonly observed lizards. Chorus frog (*Pseudacris* sp.), cricket frog (*Acris gryllus*), green tree frog (*Hyla cinerea*), bullfrog (*Lithobates catesbeianus*), American toad (*Anaxyrus americanus*), eastern spadefoot toad (*Scaphiopus holbrookii*), marbled salamander (*Ambystoma opacum*), spotted salamander (*Ambystoma maculatum*), and dusky salamander (*Desmognathus fuscus*) are often observed in the region. Non-venomous snakes include garter snake *(Thamnophis sirtalis*), king snake (Lampropeltis spp.), rat snake (*Pantherophis* spp.), and water snake (*Nerodia* spp.), while venomous species include coral snake (*Micrurus fulvius*), cottonmouth (*Agkistrodon piscivorus*), copperhead (*Agkistrodon contortrix*), pygmy rattlesnake (*Sistrurus miliarius*), and diamondback rattlesnake (*Crotalus adamanteus*) (MDWFP, 2021). Several observations of garter snakes, red-eared sliders (*Trachemys scripta), upland chorus frogs (Pseudacris feriarum), a cottonmouth, an eastern king snake (Lampropeltis getula*), and a banded water snake (*Nerodia fasciata*) were observed during field surveys. No other specific observations were noted for reptiles or amphibians.

Birds commonly found in the region include wild turkey (*Meleagris gallopavo*), northern mockingbird (*Mimus polyglottos*), red-winged blackbird (*Agelaius phoeniceus*), northern cardinal

(*Cardinalis cardinalis*), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), red-tailed hawk (*Buteo jamaicensis*), American robin (*Turdus migratorius*), starling (*Sturnus vulgaris*), brown thrasher (*Toxostoma rufum*), and turkey vulture (*Cathartes aura*) (Sibley, 2017). Flyovers from red-tailed hawk, American crow, and black vultures were observed during field surveys. Observations of American robin, American crow, northern mockingbird, field sparrow (*Spizella pusilla*), cedar waxwing (*Bombycilla cedrorum*), downy woodpecker (*Dryobates pubescens*), killdeer (*Charadrius vociferus*), great horned owl (*Bubo virginianus*) and mallard duck (*Anas platyrhynchos*) were also made throughout the Project Site. Wading birds to include great blue heron (*Ardea herodius*) and great egrets (*Ardea alba*) were observed near the norther portion of the project site near the aquaculture ponds across from Gilmer Wilburn Rd.

No caves or mines were identified on the Project Site during field surveys. Additionally, in speaking with landowners during site visits, no known caves or mines exist in proximity to the Project Site).

3.4.1.4 Threatened, Endangered, and Rare Species

The USFWS IPaC result letter (Appendix D) was obtained from the IPaC website in regard to special status species that may occur within the Survey Area (Consultation Code: 04EM1000-2021-SLI-0745, Event Code: 04EM1000-2021-E-01680). This IPaC result letter identified federally protected species or Designated Critical Habitats that occur or have the potential to occur in the Survey Area ((i.e., Endangered Species Act of 1973 (ESA) listed, proposed and candidate species), bald eagles, golden eagles, and migratory birds (including raptor species)). Additionally, consultation was conducted with MDWFP National Heritage Program which provided a list of state protected species and state ranked species of special concern with potential to occur within two miles of the Survey Area.

Three federally listed species were identified as potentially occurring within the Survey Area: the northern long-eared bat (*Myotis septentrionalis*), the wood stork (*Mycteria americana*), and Price's potato-bean (*Apios priceana*). Critical habitat for federally protected species has not been designated within Lowndes County, Mississippi. The Mississippi Natural Heritage Program is managed under the MDWFP, Museum of Natural Science. The state of Mississippi does not have state-protected designations for plants; however, there are aquatic species (mussels, fish, crayfish), amphibians, snakes, and birds that hold special state-endangered status. Several state-protected species were listed as potentially occurring in the Survey Area. The federal and state protected species listed as having potential to occur in the Survey Area are provided in Table 3-4 and discussed in further detail below.

Table 3-4: Protected Species with Potential to Occur within the Survey Area

Common Name	Scientific Name	Federal Status	State Status	Preferred Habitat Description	Habitat Present
Mammals					

Common Name	Scientific Name	Federal Status	State Status	Preferred Habitat Description	Habitat Present
Northern long-eared bat	*Myotis septentrionalis*	LT	-	Summer roosts occur in tree cavities and under exfoliating bark, but this species has also been found in buildings and behind shutters. During the winter, northern long-eared bats hibernate in tight crevices in caves and mines. Foraging is done primarily on forested hillsides and ridges	Yes
Eastern Spotted Skunk	*Spilogale putorius*	-	S1	Open prairies, brushy lands, and cultivated areas (MDC 2021)	Yes
Birds					
Wood Stork	*Mycteria americana*	LT	LE	Freshwater wetlands, including ponds, bayheads, flooded pastures, oxbow lakes, and ditches (USFWS 2020b)	Yes
Painted Bunting	*Passerina ciris*	-	S3B	Dense weedy habitats as well as the dense understory of semi-open forests (Cornell 2019a)	Yes
Scissor-tail Flycatcher	*Tyrannus forficatus*	-	S1B; S1N	Open habitats in the southern Great Plains and south Texas, often around sparsely scattered trees or utility lines (Cornell 2019b)	Yes
Plants					
Price's Potato Bean	*Apios priceana*	LT	-	Lightly disturbed areas such as forest openings, wood edges and where bluffs descend to streams	
Big-head Evax	Evax *Prolifera*	-	S1	Meadows, grasslands, sagebrush steppe, and plains (MNHP 2021)	
Slender Sedge	*Carex gracilescens*	-	S1	Mesic deciduous forest; often in sandy, rocky, and sometimes calcareous soils (WDNR 2020)	
Stiff Greenthread	*Thelesperma filifolium*	-	S1	Disturbed sites in dry sandy or gravely soil (UTA 2018)	
Nebraska Sedge	*Carex jamesii*	-	S1S2	rich mesic woodlands, wooded slopes, wooded groves (where the ground vegetation is infrequently mowed underneath large trees), and edges of woodland paths (Hilty 2020a)	
Big Shellbark Hickory	*Carya laciniosa*	-	S2	Rich alluvium of floodplains and rich mesic soil along riverbanks and marshes (NYNHP 2021)	
Bur Oak	*Quercus macrocarpa*	-	S2	Moist woodlands and bottomland forests to prairies and sandhills (USFS 2021)	

Common Name	Scientific Name	Federal Status	State Status	Preferred Habitat Description	Habitat Present
Ohio Buckeye	*Aesculus glabra*	-	S2	Moist to mesic deciduous woodlands, wooded valleys along rivers, and rocky wooded slopes in sheltered areas (Hilty 2020b)	
Prairie Parsley	*Polytaenia nuttallii*	-	S2	Upland prairies, hill prairies, limestone glades, chert glades, thinly wooded bluffs, and savannas (Hilty 2018).	
Prairie Pleatleaf	*Nemastylis geminiflora*	-	S2	Glades, prairies, and rocky slopes, on calcareous substrates – Occasionally on glades in the shade of eastern red cedars or Ashe's junipers (MDC 2020)	
Small-toothed Sedge	*Carex microdonta*	-	S2	Dry to moist, calcareous substrates in open rocky or wet prairies, swales, seeps, and ditches - Relic patches of Blackland prairies, limestone glades, and chalk openings (FNA 2020)	
Mead's Sedge	*Carex meadii*	-	S3S4	moist to dry black soil prairies, dolomite prairies, hill prairies, savannas with sparse ground vegetation, sedge meadows, limestone glades, and areas along railroads (Hilty 2019a)	
Nutmeg Hickory	*Carya myristiciformis*	-	S3S4	Banks of rivers and swamps in rich moist soils, occasionally on higher ground and often on limestone (PFAF 2021)	

Key: Statuses are LE= Listed Endangered, LT= Listed Threatened
State Rank

S1 - Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

S2 - Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

S3 - Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences).

Sources: USFWS, 2021 and Mississippi Natural Heritage Program, 2021.

Federally Listed Species

Three species listed as threatened under the ESA were identified as having potential to occur within the Project Site (Figure 3-7). None of the species described herein were observed during environmental field surveys, and no critical habitats were identified on the IPaC report (Appendix D).

The wood stork (*Mycteria americana*) is a wading bird that is federally listed as threatened. It is found primarily in freshwater wetlands, including ponds, bayheads, flooded pastures, oxbow lakes, and ditches. No nesting records are known from this area of Mississippi (USFWS 2020b).

Foraging habitat for the species was observed within all the open waters observed throughout the Survey Area.

The northern long-eared bat (*Myotis septentrionalis*) (NLEB) is federally listed as threatened under the ESA. It usually roosts in tree cavities and under exfoliating bark, but this species has also been found in buildings and behind shutters. During the winter, NLEBs hibernate in tight crevices in caves and mines. Foraging is done primarily on forested hillsides and ridges (USFWS 2015). No records of this species are known from Lowndes County, Mississippi. Approximately 358 acres of suitable summer roosting habitat for the NLEB was observed within forested areas at the Project Site, and suitable foraging habitat was observed within the perennial stream corridors, fence rows, and forests throughout the Project Site. An acoustic survey was approved by USFWS and performed throughout the suitable habitat following the 2020 U.S. Fish and Wildlife *Range-wide Indiana Bat Survey Guidelines.* Acoustic monitors were run Aug 3-5 at the Level of Effort dictated by the Guidelines (26 detector nights). NLEB was determined to be likely absent based on automated identification results.

Price's potato-bean (*Apios priceana*) is a plant that is federally listed as threatened under the ESA. It prefers lightly disturbed areas such as forest openings, wood edges and where bluffs descend to streams. It also grows along highway ROWs and powerline corridors (USFWS 2019). Potential habitat for Price's potato bean is present in central portion of the Project site within some ravines and hillslopes and the nearby forested bluffs along Gilmer Creek and its tributaries, adjacent to the central western portion the Project Site. Although potentially suitable habitat is present within the central portion of the Project Site, there were no observations of Price's potato bean during targeted botanical surveys.

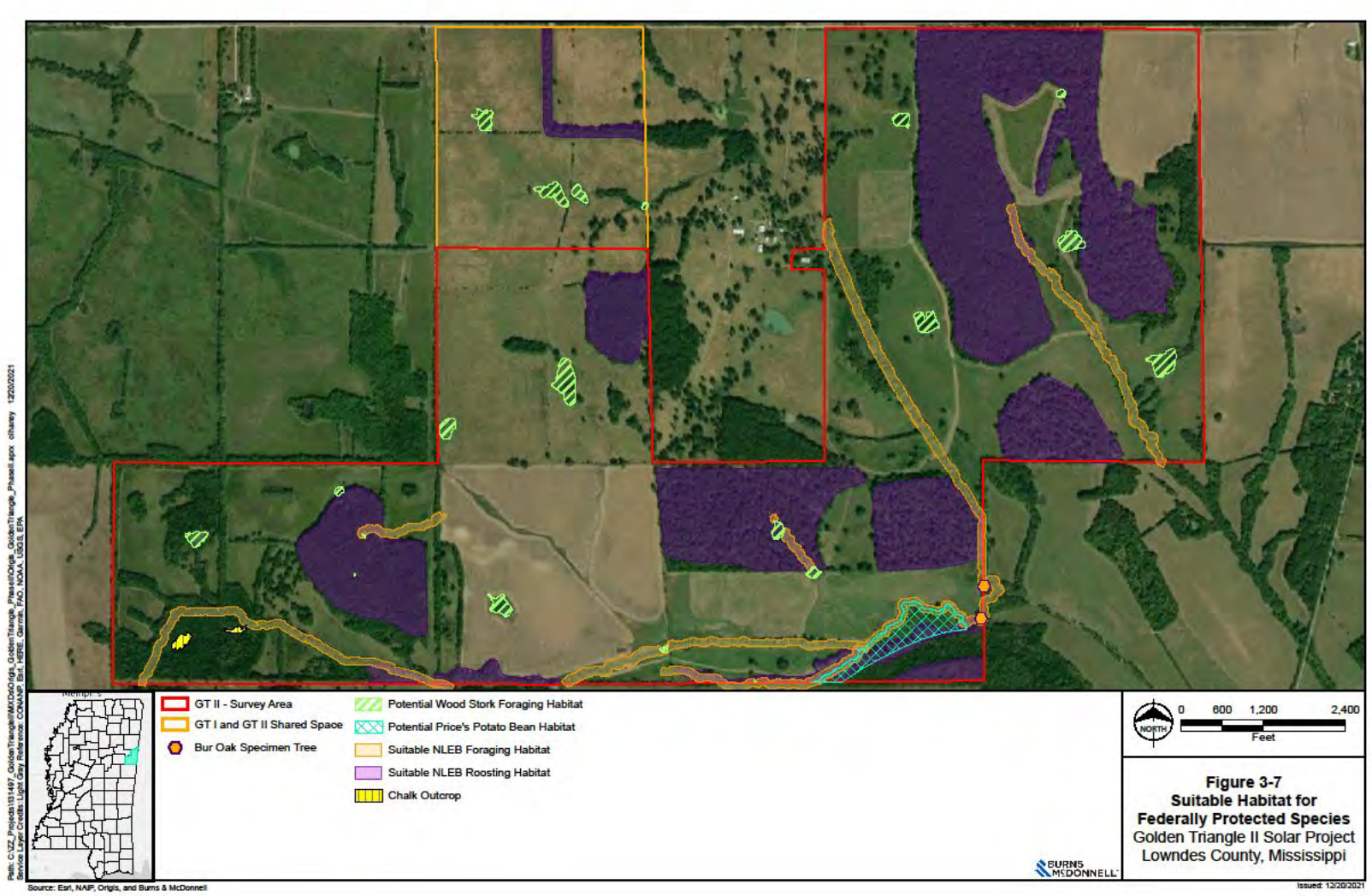


Figure 3-7: Potentially Suitable Habitat for Federally Protected Species within the Project Site

State Listed Mammals

The eastern spotted skunk is a small weasel-like skunk with dense fur baring stripes and spots in a distinctive pattern. This skunk can be found across the central and southeastern United States and northeastern Mexico (Bullock 2008). In Mississippi, the eastern spotted skunk's status is S1: Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation. Typical habitat preferences include brushy, rocky, woody habitats with extensive vegetation; and they are rarely identified in open areas or around wetlands. No observations of eastern spotted skunks occurred during field surveys; however, they are more likely to be active at night. If the eastern spotted skunk did occur within the Project area, it would likely prefer the large, dense forest just south of North Branch Mogawah Creek, which is located at the very southern boundary of the Project Site.

Bald Eagles and Migratory Birds

In Mississippi, the bald eagle is protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Protection Act (MBTA). No bald eagles or nests were confirmed to be present during the environmental field surveys within the Survey Area or along public roadways near the Project. However, one potential bald eagle nest was reported to field crews by a landowner. The potential nest is within private property outside of the Survey Area. The nest was observed from a distance in an adjacent parcel outside of the Survey Area. Photographs were attempted but were unable to provide value due to distance and obstruction from existing mature trees. The field crews were unable to confirm whether the nest was that of a bald eagle or some other bird of prey. The status of the nest is unknown, and no individuals were observed. No blasting or other extremely loud noises are anticipated during construction. At its closest point, Project-related activities would occur within approximately 1,200 feet from the potential nest and would be in compliance with National Bald and Golden Eagle Management Guidelines.

There are certain birds that are protected under the MBTA as Birds of Conservation Concern (BCC). In the April 2021, USFWS IPaC Report for the Survey Area, no USFWS-designated BCCs were identified. However, numerous migratory birds were identified through the TVA's Natural Heritage Database. Migratory birds of conservation concern identified in TVA's natural heritage data include American kestrel, bald eagle, cerulean warbler, dunlin, Kentucky warbler, lesser yellowlegs, marbled godwit, prothonotary warbler, red-headed woodpecker, rusty blackbird, short-billed dowitcher, swallow-tailed kite, willet, and wood thrush. Additionally, MDWFP indicated that scissor-tail flycatcher and the painted bunting could also occur within two miles of the Survey Area. Both species are state species of concern.

The American Kestrel is a small member of the falcon family and prefers habitats consisting of open farmland, wood edges, and cities. It breeds from April through August most likely in areas outside the Project Site (Cornell 2019c). It is most commonly found in Lowndes County, Mississippi, during December and January. No individuals or nests were observed during field surveys; however, suitable nesting and foraging habitat does occur within the Survey Area.

Ospreys (*Pandion haliaetus*) are large birds of prey that typically nest in elevated nest sites near rivers, lakes, reservoirs, lagoons, swamps, and marshes with an adequate supply of accessible fish within about twelve miles of the nest (Cornell 2019d). According to TVA's natural heritage data, there is a record from 2011 of an osprey's nest approximately 2.7 miles from the Survey Area. No nests were observed during field surveys; however, osprey could exist near the Survey Area due to the proximity of the aquaculture ponds.

Lesser yellowlegs (*Tringa flavipes*) is a small "piper" bird that breeds in meadows and open woodlands in Canada. In North America, lesser yellowlegs typically occurs in marshes, shallow wetlands, shorelines, and flooded fields during migration. Most often, they prefer vegetated wetlands rather than bare habitats (Cornell 2019e). Marginal foraging habitat is present at PEM wetlands throughout the Project Site. PEM wetlands within the Survey area were low quality, isolated, and are regularly disturbed during crop and hay harvesting.

Marbled godwit (*Limosa fedoa*) is a small shorebird with a two-toned, long, slightly upcurved bill that breeds in the shortgrass prairies near wetlands in Canada and the northern central U.S. While migrating south, marbled godwits typically inhabit native grass prairies with green needle grass, western wheatgrass, blue gram, needle-and-thread, and blue stem. Wintering grounds typically consist of coastal mudflats, estuaries, and sandy beaches (Cornell 2019f). The migration corridor for the marbled godwit is further west of the Survey Area, closer to Texas and Arkansas. Due to lack of suitable habitat and the location of the Survey Area outside of the migration corridor, marbled godwit is unlikely to occur within the Survey Area.

Red-headed woodpecker (*Melanerpes erythrocephalus*) is a medium-sized woodpecker with a bright red head, white buff, and black back. Red-headed woodpeckers breed in river bottoms, beaver swamps, burned areas, recent clearing, deciduous woodlands with oak or beech and groves of dead or dying trees. Dead or partially dead trees are important for nest cavities in areas where they breed. In Mississippi, red-headed woodpeckers typically inhabit pine and pine-oak forests (Cornell 2019g). Most of the undisturbed forested areas within the Survey Area would provide suitable habitat for red-headed woodpeckers.

As its name entails, the rusty blackbird (*Zanata Canadiense*) has distinctively rusty feather edges and pale-yellow eyes. Rusty blackbirds typically breed in wet forests, swamps, bogs, and beaver ponds. They also winter in swamps, woodlands, and pond edges. This species is considered a common bird in steep decline due to habitat loss (Cornell 2019h). Potentially suitable habitat for rusty blackbird is present near the pond edges and riparian woodlands to the open ponds.

Short billed dowitcher (*Limnodromus griseus*) is a full-bodied orange, brown, and golden shorebird with a long bill used for rhythmic probing of mudflats and flooded field for food. Short-billed dowitchers breed in the taiga shield ecotone, nest in wetlands usually near edges of bogs, small lakes, or wet meadows. During winter months, short-billed dowitchers are founds in saltwater and brackish environments such as estuaries and lagoon with tidal influences (Cornell 2019i). Marginal foraging habitat for migrant short-billed dowitchers is present in some of the shallow ponds and potentially flooded farm fields when excessive precipitation occurs.

Willet (*Tringa semipalmata*) is a straight billed, mottled brown, shorebird with distinct wing markings and a piercing call. Willets typically inhabit open beaches, marshes, mudflats, and rocky coastal zones. During the breeding season eastern willets are typically found in saltmarshes, barrier islands, and barrier beaches (Cornell 2019j). Marginal foraging habitat for migrant willets is present in some of the shallow ponds and potentially flooded farm fields from excessive precipitation.

MDWFP's Natural Heritage Data also identified two migratory birds with potential to occur within two miles of the Survey Area:

Scissor tail flycatcher (*Tyrannus forficatus*) was identified by the MDWFP as potentially occurring within two miles of the Survey Area. Scissor tail flycatchers prefer open habitats in the southern Great Plains and south Texas, often around sparsely scattered trees, or utility lines (Cornell 2019b). Open pasture within the Survey Area provides marginal foraging habitat for the scissor-tailed flycatcher.

Painted Bunting (*Passerina ciris*) was also identified by the MDWFP as potentially occurring within two miles of the Survey Area. Painted bunting prefers dense weedy habitats as well as the dense understory of semi open forests (Cornell 2019j). Although they are typically more often found further south and west, most of the forested areas within the Survey Area provide foraging habitat.

If tree clearing activities associated with construction of the Project overlap with the primary nesting season (March 15 – September 15), short-term inadvertent impacts could occur on bird species that nest in or near the construction areas. To the extent practicable, Project construction will be scheduled to minimize potential effects to bird species by minimizing clearing activities within forested areas during nesting season. Other mitigation measures MS Solar 6, LLC plans to implement include:

- Designing Project facilities to avoid sensitive resources where possible.
- Maximizing locations where the Project utilizes agricultural areas.
- Limiting the construction and operation workspaces to the minimum necessary.
- Conducting mitigation for effects to sensitive resources (e.g., wetlands) through agency permit conditions.
- Avoiding forested areas, to the greatest extent practicable.
- Minimizing routine mowing/maintenance during the bird nesting season once the Project is complete (generally March 15 through September 15 in the general Project vicinity) to the extent feasible.

On Dec. 22, 2017, the U.S. Department of the Interior (DOI) revised its guidance on incidental take of migratory birds in Memorandum M-370501, which specifies that incidental take prohibitions apply only to actions that have *as their purpose* the taking or killing of migratory birds. Under the Biden administration, the Department of the Interior withdrew its 2017 legal opinion

which preceded and formed the basis of the guidance. The new administration may return policies initiated under the Obama administration, which considered a proposal to develop an incidental take program. Because MS Solar 6, LLC's purpose is the lawful construction of a clean energy facility, and not the intentional take of migratory birds, MS Solar 6, LLC does not anticipate further coordination with USFWS regarding migratory birds; however, legal developments to MBTA should be monitored.

Terrestrial species documented in TVA's natural heritage data included northern long-eared bat, wood stork, osprey and bald eagle which are discussed above. Mitchell's satyr (*Neonnympha mitchellii*) was also identified has having the potential to occur within the Survey Area; however, that species has not been documented within three miles of the project area or from Lowndes County, Mississippi.

Mississippi State-Listed Species

The Mississippi Natural Heritage Program is managed under the MDWFP, Museum of Natural Science. Consultation was initiated with the MDWFP on February 25, 2021, and database results were issued on March 18, 2021, which indicate occurrences of state listed species or species of special concern that are known to occur within two miles of the Survey Area. Results of that correspondence are in Appendix C. According to the results, one state-listed species, the federally threatened wood stork, and 15 state ranked species of special concern have potential to occur within the Survey Area. Furthermore, MDWFP concluded that if best management practices are properly implemented, monitored, and maintained, the proposed project likely poses no threat to listed species or their habitats. Each of the species and a description of its preferred habitat is provided below. The state protected species identified are listed in Table 3-4 and discussed in further detail below.

Rare Plants

As of 2018, there are 495 plants of special concern in Mississippi. The designation of plants of special concern in Mississippi was developed for flagging sensitive species that may be adversely affected by proposed projects, determining protection priorities of natural areas that contain special plants, and determining priorities for inventory and protection for special plants to include proposing special plants for federal protection (Mississippi Natural Heritage Program, 2018).

Twenty-eight rare plant species were included in the results of the TVA Heritage Database search as potentially occurring within five miles of the Survey Area. Because MS Solar 6 is avoiding most of the wetland and stream riparian areas and chalk outcroppings and associated buffers from the construction and operation footprint, suitable habitat only exists for 13 of these plant species within the Project Site. The table below provides additional details for these 13 species.

Table 3-5: TVA Natural Heritage Database - Plants Potentially Occurring within the Survey Area

Common Name	Scientific Name	Rank	Preferred Habitat Description
Ridgestem false foxglove	*Agalinis oligophylla*	S2	Typically found from east Texas to southwest Louisiana on coastal plains primarily in prairies – Prefers moist to dry sand or clay soils and also found in pine hardwood forest and pine savannahs (USGS 2020)
Wild hyacinth	*Camassia scilloides*	S2	Black soil prairies, moist savannas, moist open woodlands along stream banks, rocky wooded slopes, and limestone glades - Typically prefer moist conditions to full sun to light shade in rich loamy soil (Hilty 2020c)
James's Sedge	*Carex jamesii*	S1S2	Mesic woodlands, wooded slopes, wooded groves, and edges of woodland paths - May also occur in upland woods and swampy woodlands and occasionally found in degraded woodland habitats (Hilty 2020a)
Small-toothed sedge	*Carex microdonta*	S3	Dry to moist, calcareous substrates in open rocky or wet prairies, swales, seeps, and ditches - Relic patches of Blackland prairies, limestone glades, and chalk openings (FNA 2020)
Kingnut Hickory	*Carya laciniosa*	S2	Bottomland woodlands, upland woodlands, swamps, savannas, and limestone glades. Usually not far from rivers (Hilty 2020d)
Scarlet Indian-paintbrush	*Castilleja coccinea*	S1	Sandy soils in prairies and open woods (USFS 2020)
Pumpkin ash	*Fraximus profunda*	S3	Moist wet conditions often in swamps or floodplains, wet bottomlands, river valleys, and low areas. Often in bald cypress swamps, cottonwood, and tupelo swamps (MBG 2020a)
Canada moonseed	*Menispermum canadense*	S3	Deciduous woodlands, woodland borders, thickets, semi-shaded riverbanks, cleared powerline ROWs, overgrown fencerows, and hedges (Hilty 2020e)
Prairie pleatleaf	*Nemastylis geminiflora*	S2	Glades, prairies, and rocky slopes, on calcareous substrates – Occasionally on glades in the shade of eastern red cedars or Ashe's junipers (MDC 2020)
Bur oak	*Quercus macrocarpa*	S2	Bottomland soils in woodland and stream valleys (MBG 2020b)
Heath aster	*Symphyotrichum ericoides*	S2	Mesic to dry black soil prairies, gravel prairies, dolomite prairies, hill prairies, savannas, openings in dry rocky forests, limestone glades, roadsides and railroad sides, and pastures (Hilty, 2020f)
Southern Meadow Rue	*Thalictrum debile*	S1S2	Floodplain forests over calcareous substrates – prefers rich, rocky limestone woods often near streams (Chafin 2007).
Great Plains Ladies'-tresses	*Spiranthes magnicamporum*	S2	Open prairie and higher pH soils in both low and, moist areas and higher, gravelly sites (Minnesotawildflowers 2021)

Common Name	Scientific Name	Rank	Preferred Habitat Description
S1 = Critically Imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation. S2 = Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation. S1S2 = Rank range between S1 and S2. S3 = Vulnerable in Mississippi due to a restricted range (on the order of 21 to 100 occurrences), relatively few populations or occurrences, recent and widespread declines, or other factors making it vulnerable to extirpation.			

Source: TVA's Heritage Database "Botany within 5 Miles"

During field surveys, one species of state listed tree was observed in the forested area along the fence line of the southeast border of the Survey Area: bur oak (*Quercus macrocarpa*) (state ranked S2). Bur oak observations were limited to two individuals in lower elevations along a stream in the same general area. The two individuals were mature trees and had a diameter at breast height (dbh) of three to four feet. Representative photos are provided in Burns & McDonnell's *Protected Species Habitat Assessment Report* (Appendix D).

Two areas of open chalk outcrops and associated buffers were also mapped in the southwest portion of the Survey Areas as areas that could potentially support sensitive plant species and will be recommended as avoidance areas. No rare plants were observed at or near the chalk outcrops during surveys.

Rare Aquatic Species

With the exception of the white heelsplitter (S3), all aquatic species identified in the TVA Natural Heritage Database (listed below in Table 3-6) as potentially occurring within 10-miles of the Survey Area require aquatic habitats primarily comprised of medium to large rivers with moderate to fast moving currents.

Table 3-6: TVA Natural Heritage Database – Aquatic Species Potentially Occurring within 10-miles of Survey Area.

Common Name	Scientific Name	Rank/Status	Preferred Habitat Description
Blue Sucker	*Cycleptus elongatus*	S3	Large rivers with deep channels and swift currents that have substrates consisting of sand, gravel or rubble bottoms. (MDNR 2021a)
Crystal Darter	*Crystallaria asprella*	S1/LE	Medium to large rivers, usually with moderate to swift currents and clean sandy or gravel bottoms (MDNR 2021b)
Cylinder Elimia	*Elimia cylindracea*	S2	Riffle habitats often in areas with rocky legdes (NatureServe 2021)
Flat Pigtoe	*Pleurobema marshalli*	SX/LE	Medium to large rivers with moderate to fast current and sandy gravel to gravel cobble substrates and clean water (NatureServe 2021b)

Common Name	Scientific Name	Rank/Status	Preferred Habitat Description
Frecklebelly Madtom	*Noturus munitus*	S2/LE	Fast moving streams associated with larger rivers that provide firm gravel substrates with pebbles and rock (USFWS 2020).
Freckled Darter	*Percina lenticula*	S2	Medium to large rivers with deep and swift currents (NatureServe 2021c)
Heavy Pigtoe	*Pleurobema taitianum*	SX/LE	Riffles and shoals of small to large rivers with sandy gravel to gravel-cobble substrates and moderate to fast currents (NatureServe 2021d).
Southern Clubshell	*Pleurobema decisum*	S1	Highly oxygenated small to medium rivers with loose sand and gravel substrates (NatureServe 2021e).
Southern Combshell	*Epioblasma penita*	S1/LE	Medium sized rivers with high gradient and riffles with sandy gravel to gravel cobble substrates in moderate to swift currents (NatureServe 2021f).
Stirrupshell	*Quadrula stapes*	SX/LE	Medium to large rivers with moderate to fast current and sandy gravel to gravel cobble substrates and clean water (NatureServe 2021g)
Striped Bass	*Morone saxatilis*	SH	Coastal estuaries; migrates upstream to medium to large rivers during spawning typically within 6 km of the shore (NatureServe 2021h).
White Heelsplitter	*Lasmigona complanata*	S3	Rivers and stream of various sizes with substrates of gravel, sand, or mud (NatureServe 2021i).

S1 = Critically Imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation.
S2 = Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
S3 = Vulnerable in Mississippi due to a restricted range (on the order of 21 to 100 occurrences), relatively few populations or occurrences, recent and widespread declines, or other factors making it vulnerable to extirpation.
SH = Possibly Extirpated – Known from only historical records in Mississippi, but still some home of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty.
SX = Presumed Extirpated – Species or ecosystem is believed to be extirpated from Mississippi. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

The six perennial streams identified within the Survey Area had limited flow and fragmented sections of water throughout the reaches. Perennial streams within the Survey Area were characterized by the presence of flow at the time of the site visit as well as secondary characteristics such as observance of fish and rooted aquatic fauna, indicating that water flows year-round. Perennial streams were approximately 6 to 25 feet in width at the OHWM with bank

heights ranging from 3 to 25 feet. At the time of the delineation, the depth of water observed was 0.5 to 2.5 feet. Perennial streams flowed through upland fields, agricultural fields, and wooded riparian areas.

Observations of gambusia were documented during field surveys. However, no fish or macroinvertebrate sampling was conducted. No other observations of aquatic species were documented. Representative photographs of each stream flow regime type are provided in Appendix D.

Perennial streams within the Survey Area do not meet habitat requirements for these species. White heelsplitters can be found in a variety of freshwater settings and perennial stream within the Survey Area may provide marginal habitat for this species. Additionally, proposed solar array layouts would be designed to avoid perennial stream and their buffers. Therefore, impacts to aquatic species within the Survey Area are not expected.

3.4.2 Environmental Consequences – Biological Resources

3.4.2.1 No Action Alternative

Under the No Action Alternative, there would be no impacts to biological resources at the Project Site. It is assumed that existing agricultural operations would continue, and the undeveloped land would remain as is. There would be no Project-related impacts to existing vegetation at the Project Site. The forested areas within the Project Site could eventually be cleared for other development or landowner preference. Additional minor impacts to vegetation and wildlife could occur through continued applications of pesticides, herbicides, and fertilizers. No Project-related impacts would occur.

3.4.2.2 Proposed Action

Natural Areas

The Proposed Action is not anticipated to have any impacts on the biological resources associated with natural areas, given the nature of the activities and distance from the Project Site to the natural areas.

Vegetation

Under the Proposed Action the Solar Facility would be constructed and put into service, which would lead to direct adverse impacts to vegetation. Up to 270 acres of forested upland areas could be removed during initial construction clearing and grading activities to increase available land used for arrays and to reduce shading to the PV arrays.

Rare & Protected Plant Species

Most of the forested areas that provide habitat for protected species or species that are biologically sensitive are present within avoidance buffers established for riparian areas along jurisdictional water features. Other areas have been excluded from the Project Site during planning and design stages because of topographic and constructability concerns. Avoidance

areas will be established onsite with signage or temporary construction fencing as well as identified on constraints/avoidance plans. Further, these areas will be included on engineering/constraints drawings provided to the construction contractor.

No observations of federal noxious weeds were documented within the Project Site. Upon completion of construction, the site would be planted or seeded with non-invasive vegetation, including native and naturalized plant species to encourage beneficial habitat, reduce erosion, and limit the spread of invasive species as part of the revegetation strategy, in accordance with EO 13112. Seed selection for the re-vegetation strategy would be developed to plant lower growing species in effort to reduce the amount of maintenance required below the PV arrays. If the construction of the Project increases growth of invasive species, these effects would be reduced once the re-vegetation process is initiated, and native and non-invasive species are established. MS Solar 6 would spot treat areas where invasive species/weeds begin growing until the native and non-invasive species are established throughout the site. MS Solar 6 would not implement an invasive species control plan or cogon grass plan within areas that were pre-established as avoidance areas during construction and operation as the intent of the avoidance area is to limit access to these areas by workers and equipment. Implementation of the Proposed Action would not significantly contribute to the introduction or spread of invasive species.

Of the approximately 270 acres of forested uplands within the Project Site, the majority of forested habitat could be developed for the Solar Facility and may be cleared to reduce shading for the PV arrays. Riparian areas would remain intact at and around jurisdictional streams and wetlands and avoided during construction to the greatest extent practicable. Tree removal in general would be minimized to the greatest extent practicable.

A majority of the Project Site is either disturbed, maintained, or actively cultivated cropland. There is potential to remove a minor amount of forested area within the Project Site (<18 percent) during clearing and grading activities. Additionally, the surrounding areas consist of similar vegetation communities and have also been mostly converted to cropland. Adverse impacts associated with vegetation removal resulting from implementation of the Proposed Action would be minor but long-term.

Wildlife

Under the Proposed Action, the Solar Facility would be constructed, and negligible direct and indirect impacts could occur to wildlife. Most of the area proposed to be cleared is land currently used for agriculture and/or livestock grazing. Clearing of 270 acres out of approximately 480 acres total of forested habitats (woody wetlands and upland forests) could have moderate direct and indirect effects on wildlife utilizing those habitats. Impacts resulting from construction and operation of the Solar Facility would be temporary due to displacement of native species during construction. Direct effects on less mobile species or life stages of wildlife occurring at the site (i.e., nestlings, eggs, larvae, and burrowed animals) could occur during initial land clearing and grading activities. As mentioned above, forested riparian areas would be avoided to the greatest extent possible. Wildlife that are present are expected to disperse to suitable habitat nearby when

construction activities commence. Wildlife species able to use early successional habitats would be able to return to the Project Site once construction activities are complete.

The habitat present is similar to the landscape and land use in surrounding areas. It is expected that wildlife in the Project Site would be able to relocate successfully to nearby areas of similar habitat and food resources during construction. Because the Project Site would be revegetated with native and/or naturalized non-invasive herbaceous plants maintained without the extensive use of harmful herbicides and pesticides, the site would provide a small amount of potentially suitable nesting and long-term foraging habitat for some species of songbirds and small mammals. Therefore, short-term direct and indirect impacts to wildlife during construction of the Proposed Action would be moderate. Minor long-term benefits would be realized for some species such as insects, small mammals, and reptiles and amphibians as frequently disturbed crop fields are established with native and non-invasive vegetation after construction.

Mississippi State-Listed Species

Suitable habitat for three state-listed animals was identified within the Project Site: the eastern spotted skunk, painted bunting, and scissor-tail flycatcher. If utilizing areas for nesting within the Project Site, minor, short-term, direct impacts to painted bunting and scissor-tail flycatcher may occur if vegetation removal is implemented during their breeding season. If the eastern spotted skunk is present within the Project Site, it would likely relocate to nearby areas with similar habitat during construction. However, minor, short-term, direct impacts to younger individuals or individuals with slower mobility may occur during construction. Additionally, temporary impacts from construction activities may discourage these species from entering the area; however, they are expected to return to areas of suitable habitat within the Project Site once the project is operational and native grasses have been established. In areas where forested habitat is permanently converted to open space where PV arrays are located, forest-dwelling species would likely relocate to woody areas at the southern portion of the Project Site.

The Project was designed to minimize impacts on natural vegetation communities to the extent practicable. Specifically, most of the chalk prairie complex has been designated as a “no build area” for several reasons, including its potential as habitat for protected species. The chalk outcroppings at the Project Site would be completely avoided. Additionally, where construction impact areas overlapped with areas identified as potentially suitable habitat for rare and protected plants, the solar array layout would be designed to avoid impacts. Two individual bur oak trees were the only listed plant species observed during surveys which were within areas that would be excluded from development. Therefore, many rare plant or insect species that may occur within those habitats would remain unimpacted by the Project. TVA’s Natural Heritage Program identified 28 plant species, 12 aquatic species, and 5 animal species within a 10-mile radius, 5-mile radius, and within the Project Site, respectively. However, MS Solar 6 has minimized development activities within areas identified as suitable habitat for rare species. Additionally, a 100-foot-wide buffer has been established around these areas to further reduce potential adverse impacts.

Federally Listed Species

The wood stork is federally protected under the ESA. Wood storks typically develop roosting sites in medium to tall trees that occur in stands either in swamps or on islands surrounded by relatively broad expanses of open water; primarily bald cypress (*Taxodium distichum*) swamps. Nesting usually occurs in bald cypress trees in swamps. Wetlands within the Survey Area were small, isolated, and low quality with little to no surface water (Appendix D). Therefore, no suitable roosting habitat for wood storks was observed within the Survey Area; however, marginal foraging habitat for the species was observed within most of the small and confined ponds throughout the Survey Area. As the current layout shows, the area of impact has been designed to avoid any impacts on wetlands. There are also large aquaculture/fish farms both north and south of the Project that may attract foraging wood storks. The Project would not affect fish farms or large open waters outside the immediate Project limits. For these reasons, impacts to wood storks or wood stork habitat are not anticipated from implementation of the Proposed Action.

Only four populations of Price's potato-bean are known to exist in Mississippi today because of its specific habitat requirements (USFWS 2016). Areas within the Project Site that could potentially support Price's potato bean will be avoided. During the survey, no individuals were observed. Additionally, the small chalk prairie complex has been designated as an "avoidance area" for several reasons, including its potential as habitat for protected species. For these reasons, the Proposed Action would have no effect to Price's potato-bean.

Suitable foraging habitat for the NLEB was identified over ponds, wetlands, and streams located in the Project Site [Appendix D (Appendix D – Figure A-1)]. Approximately 328 acres of suitable summer roost habitat is also present in the forested areas. However, the results of the acoustic bat surveys indicated that there are no NLEBs within the Project Area. Consultation under Section 7 of the Endangered Species Act is underway regarding potential impacts to NLEB.

Bald Eagles and Migratory Birds

Sparse habitat along the forest edges and vegetated stream corridors may provide habitat for migratory birds within the Project Site. Wetlands, streams, and forested areas would be avoided to the greatest extent practicable under the Proposed Action. Up to 270 acres of tree removal could be conducted during construction. Implementation of the Proposed Action may reduce negligible amounts of nesting habitat, reduce minor amounts of foraging habitat, and may displace birds to surrounding areas with similar habitat and land use during construction. Most riparian areas will be avoided, however, minor direct impacts to rusty blackbirds may occur if pond edges and riparian woodlands are disturbed. Mortality to rusty blackbirds from vegetation removal could happen if tree clearing is conducted during its breeding season, however, it would most likely cause birds to flush and have to relocate to similar habitat nearby. Implementation of the Proposed Action may also reduce minor foraging habitat for species such as the American kestrel and other birds of prey that use farm fields as foraging habitat. However, it is assumed any birds using the farms fields within the Project Site for foraging would use adjacent lands if there were a significant reduction in prey items. Red headed woodpeckers may be present in forested areas proposed for clearing. Tree clearing could occur in May, June, July, August, and September which

is the bird's breeding season. The most likely impact would be limited to red-headed woodpeckers relocating to nearby areas of similar habitat during active construction. In smaller numbers, inadvertent instances of bird mortality could take place if red headed woodpecker nests occur within trees that would be cleared during its breeding season. Impacts would be direct and adverse, but minor in these instances. Long-term, the Project Site would provide nesting and foraging habitat for some species of songbirds able to use early successional habitats once operational.

Due to limited nesting and foraging habitat for migratory birds currently at the Project Site, no significant direct or indirect adverse impacts on migratory birds or bald eagles are expected from Project activities.

3.5 Visual Resources

Visual resources are described as physical features or visual characteristics of a place that define the visual and aesthetic character of an area. The following sections describe the aesthetic and visual characteristics of the Project Site and surrounding areas.

3.5.1 Affected Environment

Visual resources are the visible features of an area and can include both natural viewsheds and viewsheds comprised of manmade attributes. Visual resources can influence how an observer experiences a certain location and how they may distinguish the location from other locations. Visual resources are important to the people living in and traveling through an area. Additionally, visual resources can make up a significant component of historically and/or culturally significant settings. Additional information pertaining to the visual APE and historic or culturally significant resources is provided in section 3.8.1.

During preliminary field surveys, Project historians conducted a viewshed analysis to document the actual visibility of the Project within an established Visual APE that accounts for terrain, vegetation, and other setting intrusions that would impede views of the Project. The Project Site constitutes the established APE for physical impacts while the ½ mile buffer around the Physical APE was developed to account for visual and other non-physical effects from Project implementation. The Visual APE is comprised of approximately 1,524 acres (Project Site) plus an additional ½ mile buffer around the outside of the Project Site.

All but the forested areas of the Project Site are comprised of active agricultural land and pastureland for livestock grazing. The active agriculture area is used to produce a rotational mix of corn and soybeans. There are several mature stands of hardwood forests around the Project Site, as visible in Figure 2-1. The Golden Triangle I Solar and BESS Project is located just north of GT2. The Golden Triangle Regional Airport (GTR) is located approximately three miles northeast of the Project Site. GTR is a commercial airport but also is used by private airlines due to its central location. Small jets land and take off from this airport regularly (an average of approximately 1 – 2 airplanes per hour).

The photos below provide representative views of the Project Site. Generally, the Project Site is rural and agricultural with isolated single-family homes adjacent to the Project Site. There are three single home residences located within less than 1/2 mile from the Project site. The topography is characterized by generally flat terrain to gently rolling hills interspersed with intermittent and perennial streams. Scenic attractiveness is separated into three classes: Class A – Distinctive; Class B – Typical, and Class C – Indistinctive. The scenic attractiveness of the Project Site is rated as typical, which means the visual aesthetics are considered common of a rural-agricultural and sparsely residential area. The Scenic integrity is assessed as moderate due to the surrounding railroad operations and commercial airport.

Figure 3-8: General Site Photo of Golden Triangle II Project Site



Figure 3-9: General Site Photo of Golden Triangle II Project Site



The Project is located within the Mississippi Hills National Heritage Area (MHNHA), which was designated by Congress and the President in April 2009, through the Omnibus Public Land Management Act of 2009. The MHNHA fully covers 19 counties and portions of 11 counties in the northeastern part of Mississippi. The MHNHA is representative of a distinct cultural landscape that has been shaped predominantly by the intersection of the Appalachian and Delta cultures. National Heritage Areas are places where cultural, historic, and natural resources unite as a significant national landscape. NHAs are a partnership unit of the National Park Service (NPS), but unlike the national parks managed by the NPS, NHAs are large, lived-in landscapes. The primary theme of the MHNHA is African-American heritage, Native American history, Civil War, and music and literature (Mississippi Hills National Heritage Area, 2021). The MHNHA includes the Elvis Presley Birthplace and Museum, the Natchez Trace Parkway, the homes of William Faulkner and Tennessee Williams, the Corinth Civil War Interpretive Center, and Brices Cross Roads National Battlefield. No associated MHNHA markers or Civil War battle sites were identified within the Physical APE or Study Area (Shaver, Harris, House, and Kepka 2021).

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility and associated structures would not be constructed; therefore, no Project-related impacts to visual resources would result. Existing views would be expected to remain unchanged from the present conditions, which are either natural and undeveloped or open fields under agricultural use.

3.5.2.2 Proposed Action

The Project would convert mostly agricultural land and pastureland into industrial/electrical infrastructure consisting mostly of low-profile PV arrays. Figure 2-2 provides the preliminary layout for PV arrays.

During site visits, which occurred between June to September 2021, Burns & McDonnell assessed the potential for visual impacts on sensitive areas such as residences, churches, schools, and from roadways. There are two minimally traveled gravel public roadways that either abut or are in close proximity to portions of the Project Site:

- Gilmer Wilburn Road: runs east to west along northern project boundary
- Hardy Billups Road: runs north to south approximately 2,000 feet east of GT2.

From the above listed vantage points, the manufactured and structural appearance of the Solar Facility would be most obvious in the morning, when the dark-colored solar panels would be upright, averaging approximately eight feet from the ground, at full tilt, facing east. At midday, the panels would be less obvious as they are laying nearly flat. At midday, when the panels are flat, they would average about five feet off the ground. In the evening, when the panels would be at full tilt and facing west, they would be most obvious along Gilmer Wilburn Road.



Figure 3-10: Representative Photo of Single-Axis Tracking PV System in the Morning, Facing East

Figure 3-11: Representative Photo of Single-Axis Tracking PV System at Midday, Laying Flat



Although portions of the Project would be visible across open fields or otherwise clear areas, the residential properties and roadways in the vicinity of the Project Site generally have mature trees along or near property boundaries and fence lines that would partially or almost fully obscure views of the Solar Facility from many vantage points. The relatively stable elevations and the maintenance of existing vegetation along the perimeter of the Project Site would largely shield views from most vantage points to the Solar Facility.

There are several single-family homes located within close proximity to the Project Site. One home is located approximately 2,200 feet west of GT2 on the south side of Gilmer Wilburn Road. A second home is on a parcel located in between two GT2 parcels. At its closest point, the home is 525 feet from the limits of GT2; however, the home is surrounded by mature trees that will likely obstruct the resident's view of the solar arrays. A third home is located along the north side of Gilmer Wilburn Road, just north of GT2 and east of the aquaculture facility. It is only about 275 feet from the Project Site; however, there is a dense stand of mature trees between the home and GT2. It is unlikely that this resident will be able to view the solar arrays from its property.

Single family homes adjacent to the Project site will likely be able to view the solar arrays when residents are coming or going, but there are vegetated fencerows with mature trees along the parcel boundaries which would likely provide natural screening from any arrays that could be positioned in this area when residents are at home. With the natural vegetation screening and vegetated fencerows, no long-term adverse direct impacts on single-family home areas would occur from the Project.

Construction of the proposed Project would temporarily alter the visual character of the Project Site. During construction, heavy machinery would be present, changing the visual characteristics from vantage points surrounding the Project Site. Within the Project Site, many trees and other tall vegetation would be preserved to the extent practicable, which would provide natural buffers from public roadways. In areas where grading would be necessary, minor changes to the contour, color, and texture of the scenery would be visible. The Project Site would appear as a mixture of

neutral colors such as dark browns and grays due to earthmoving, road construction, and concrete activities. Water would be used to suppress dust. Visual impacts from construction would be minimal at night since most construction is anticipated to occur during the day. Erosion control silt fencing and sediment traps would be removed once construction is complete, and bare areas would be promptly vegetated.

Over the approximately 17-month-long construction phase, indirect impacts to visual resources in the area may occur due to increased traffic and movement of heavy machinery to the Project Site along local roads. Overall, there would be minor temporary direct and indirect impacts to visual resources during the construction phase of the Proposed Action.

Visual impacts during the operation phase of the Project would be minor in the immediate vicinity, due to substantial tree buffers around property boundaries and rolling hills within the Project Site. Visual impacts would be minimal to negligible on a larger scale, due to variation of the visual attributes of the surrounding area as distance from the Project Site increases.

3.6 Noise

The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetation cover. Two measures that relate the time-varying quality of environmental noise to its known effect to people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq} plus 10 dBA added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 p.m. and 7:00 a.m.). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered 3 A-weighted decibels (dBA); 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise (or halving, if the noise is decreasing).

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety*, which evaluated the effects of environmental noise on public health and welfare (USEPA 1974). In this document, the EPA indicated that a L_{dn} of 55 dBA is the noise threshold that would prevent outdoor activity interference or annoyance from continuous noise. We have adopted this criterion and use it to evaluate potential noise impacts from TVA projects at noise sensitive areas (NSAs) such as residences, schools, or hospitals. A L_{dn} of 55 dBA is equivalent to a continuous sound level of 48.6 dBA for facilities that generate constant sound levels. A list of typical sound levels for common sound sources is presented in the table below.

Table 3-7: Typical Sound Pressure Levels Associated with Common Sound Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 feet	--
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 feet	--
120	Threshold of feeling	Elevated train	Hard rock band
110	--	Jet flyover at 1,000 feet	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 feet, auto horn at 10 feet, crowd sound at football game	--
90	--	Propeller plane flyover at 1,000 feet, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 miles per hour) at 50 feet	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 feet, near highway traffic	General office
50	Quiet	--	Private office
40	--	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Inside average residence (without TV and stereo)
20	--	Rustling leaves	Quiet theater, whisper
10	Just audible	--	Human breathing
0	Threshold of hearing	--	--
Sources: Egan, 1988; Ramsey and Sleeper, 1994			

3.6.1 Affected Environment

The proposed Solar Facility is located in a rural area adjacent to local roadways, a rail line to the west, and the Golden Triangle Regional Airport is about three miles to the northeast. The major noise sources in this area are vehicles traveling along the gravel roadways, trains running on the railroad, private and commercial jets, farm equipment, wind, and farm animals. Noise levels in rural areas typically range from 45 to 55 dBA (A-weighted decibels, a measure of noise level). A day-night average sound level of 55 dBA is commonly used as a threshold for noise levels which could result in adverse impacts. Prolonged exposure to levels above 65 dBA is considered unsuitable for residential areas.

There are several single-family homes located within close proximity to the Project Site. One home is located approximately 2,200 feet west of GT2 on the south side of Gilmer Wilburn Road.

A second home is on a parcel located in between two GT2 parcels. At its closest point, the home is 525 feet from the limits of GT2. A third home is located along the north side of Gilmer Wilburn Road, just north of GT2 and east of the aquaculture facility. It is about 275 feet from the Project Site boundaries.

3.6.2 Environmental Consequences - Noise

3.6.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility and associated structures would not be constructed; therefore, no Project-related noise impacts would result. Current noise impacts related to air traffic, train operations, and agricultural land use, which is likely minimal, would persist.

3.6.2.2 Proposed Action

Under the Proposed Action Alternative, noise levels would be temporarily elevated in the areas immediately surrounding the Project Site when construction is occurring. Construction activities such as tree removal, site grading, and installation of the PV panel support posts would generate noise on a temporary basis. Maximum noise levels produced by the construction equipment are in the range of 80 to 85 dBA at a distance of 50 feet. The nearest occupied residence is approximately 275 feet from the Project Site. Nearby residents would likely experience elevated noise levels caused by the operation of construction equipment during daytime hours (typically 8am – 7pm) as well as an increase in traffic during peak morning and evening commutes. However, the elevated noise levels would be short in duration and would not occur at night. Furthermore, the elevated noise levels at the closest residence would not exceed the 65 dBA for prolonged periods of time.

As the Project design evolves, MS Solar 6 would locate inverters at least 500 feet away from residences. If a 500-foot setback could not be accomplished for the nearest residence, once the Solar Facility is operational, mufflers or sound reducing devices may be installed on inverters that are located within 500 feet of the single-family home if an increase in noise from the Solar Facility occurs. Periodic maintenance activities, such as mowing, would temporarily increase noise levels; however, these levels would be consistent with the existing agricultural operations that have historically occurred in the area. Overall, the noise impacts resulting from both construction and operation of the Project would be negligible.

3.7 Air Quality and Greenhouse Gas Emissions

This section describes existing air quality and GHG emissions in the Project region and the potential impacts on air quality and GHG emissions that would be associated with the No Action and Proposed Action Alternatives.

3.7.1 Affected Environment

Ambient air quality is determined by the type and concentration of pollutants emitted into the atmosphere, the size and topography of the air shed in question, and the prevailing meteorological

conditions in that air shed. With the issuance of the Clean Air Act of 1970 and its amendments, Congress mandated the protection and enhancement of our nation's air quality. USEPA established the National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants to protect public health and welfare: sulfur dioxide (SO_2), ozone, nitrogen dioxide, particulate matter whose particles are less than or equal to 10 micrometers (PM_{10}), particulate matter whose particles are less than or equal to 2.5 micrometers ($PM_{2.5}$), carbon monoxide (CO), and lead.

Primary NAAQS were developed to protect public health and safety, and secondary NAAQS were developed to protect public welfare (e.g., visibility, crops, forests, soils, and materials) from known or potential adverse effects of air pollutants. Areas in compliance with the NAAQS are designated "attainment" areas. Areas not in compliance with the NAAQS are designated as "nonattainment" areas. New sources proposed in or near nonattainment areas may be subject to more stringent air permitting requirements. Nonattainment areas are usually defined by county. National standards may not be exceeded more than once per year (except where noted). Areas that cannot be classified based on available information for a specific pollutant are designated as "unclassifiable" and are treated as attainment areas unless proven otherwise. If an area that was formerly designated as nonattainment for a particular pollutant later qualifies as attainment, that area is then categorized as "maintenance" for that pollutant for the next 20 years as long as the area continues to meet the NAAQS for that pollutant. If an area remains in attainment for the 20-year maintenance period, the status will qualify it to be formally designated back to normal attainment.

3.7.1.1 Regional Air Quality

The area where the Project is located is in rural Lowndes County, which has little development in the vicinity apart from that related to rural-residential and agricultural uses. Denser development is approximately 10 miles or more to the west in Starkville and about 12 miles to the east in Columbus. Lowndes County is considered in attainment for all pollutants (USEPA 2021a).

Table 3-8 presents the most recent (2017) USEPA emission inventory data (USEPA 2021d) for the most prevalent NAAQS pollutants for Lowndes County. These data represent anthropogenic emissions from all stationary source and mobile source activities. Included in Lowndes County is the City of Columbus, the Columbus Airforce Base, and the Golden Triangle Regional Airport, which offers private and commercial flights. All values fall beneath the USEPA thresholds for NAAQS pollutants.

Table 3-8: Average Emissions of NAAQS Pollutants in Lowndes County

Pollutant	Emissions for Lowndes County (tons per year)
Carbon Monoxide	5,168
Nitrogen Oxides (NO_x)	2,992
PM_{10}	7,393
$PM_{2.5}$	1,300

Pollutant	Emissions for Lowndes County (tons per year)
Sulfur Dioxide (SO_2)	452
Volatile Organic Compounds (VOCs)	11,491

Source: EPA 2021d

3.7.1.2 Regional Climate

The Project Site is located almost halfway between Starkville and Columbus, MS. This region of the country is known as the humid subtropical climate region and is characterized by temperate winters; long, hot summers; and rainfall that is evenly distributed throughout the year. Normal annual precipitation at the Project Site is 55 inches per year. Typical weather conditions in Artesia range from 91° to 72° in the summer months and 54° to 36° in the winter months with mild Spring and Fall temperatures.

The Antecedent Precipitation Tool (APT) – developed by the USACE – was used to assess the climate conditions in the months leading up to and during the March 2021 environmental survey. The APT provides a standardized method for evaluating precipitation conditions relative to a climate normal, the presence of drought conditions, and the approximate dates of wet and dry seasons for a given location.

At the time of the March 2021 survey, conditions on site appeared to be dry, with little to no rainfall immediately before field mobilization. The APT results confirm that conditions on site were normal, and the overall drought index (PDSI) was listed as mild wetness. Rainfall data reported from the APT is available as an Appendix to the Wetland and Waterbody Delineation Report (Appendix B).

3.7.1.3 Greenhouse Gas Emissions

Greenhouse Gases typically consist of natural and man-made compounds that are released into the earth's atmosphere. GHGs also absorb a portion of Earth's infrared radiation and can re-emit some of the radiation back to the earth's surface. When radiation is emitted back to the earth's surface, temperatures are typically warmer than they would naturally be. With that process, GHGs act as insulation and contribute to the maintenance of global temperatures. Increasing levels of GHGs in the atmosphere result in an increase in temperature on earth, commonly known as global warming. Changes in climate associated with global warming produce adverse economic and social consequences globally through changes in weather (e.g., more intense natural disasters, greater risk for forest fires, flooding) (USGCRP 2020). However, as shown in Figure 3-12, for the State of Mississippi, there is currently no noticeable long-term upward trend in temperature.

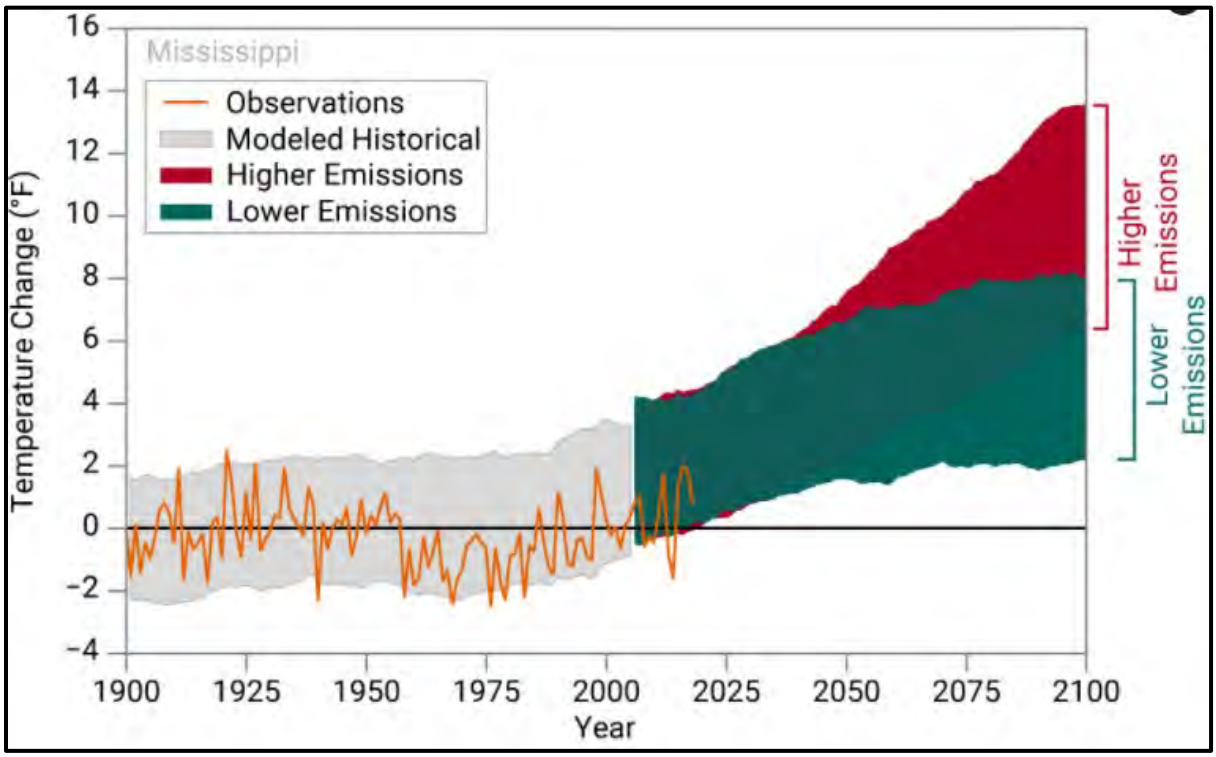


Figure 3-12: Observed and Projected Temperature Change in Mississippi

Source: NOAA 2019

The primary GHG emitted by human activities in the U.S. is carbon dioxide (other than water vapor), representing approximately 82 percent of total GHG emissions in the US (USEPA 2021e). Dominant sources of carbon dioxide and of overall GHG emissions is fossil fuel combustion. Emissions of the GHG methane, which have declined in the U.S. from levels in 1990, are primarily a result of digestion of domestic livestock, decomposition materials in landfills, coal mining, and natural gas leaks. Agricultural soil management is the major source of the GHG nitrous oxide emissions in the United States, representing approximately 74 percent of its emissions from human activities (USEPA 2021e).

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed. Therefore, no air emissions or GHGs would be generated by equipment or vehicles from construction or operation of the Solar Facility. Existing land use would be expected to remain as a mix of farmland and undeveloped land, and the only ongoing emissions would be due to vehicles or equipment used to operate the farms or maintain the agricultural clearings, and from domestic livestock operations.

3.7.2.2 Proposed Action Alternative

Under the Proposed Action, minor direct impacts on air quality would be anticipated as a result of construction and operation of the Project. Temporary impacts to GHG emissions expected during construction would be negligible.

Regional Air Quality

The majority of potential air quality impacts associated with the Proposed Action would occur during construction. Construction activities would result in emissions from the operation of construction equipment, contracted employees' personal vehicles, and fugitive dust suspension from clearing, grading, and other activities across exposed dry soil. Tree debris from clearing would be removed by either burning or chipping and grinding. As burning may occur, this could generate temporary localized air quality impacts due to smoke particles and gases. Any such burning of vegetative debris would be done in accordance with local ordinances or burn permits and is not expected to have any health consequences for this rural area.

The use of construction equipment would cause a minor temporary increase in GHG emissions during construction. Combustion of gasoline and diesel fuels by internal combustion engines (haul trucks and off-road vehicles) would generate local emissions of PM, NO_x, CO, VOCs, and SO_2. The total amount of these emissions would be small and would result in negligible air quality impacts overall.

Approximately 95 percent (by weight) of fugitive emissions from vehicular traffic over paved and unpaved roads would be composed mainly of particles that would be deposited near the roadways routes taken to reach the Project Site. As necessary, fugitive dust emissions from construction areas and paved and unpaved roads would be mitigated using wet suppression. Wet suppression would reduce fugitive dust emissions from roadways and unpaved areas by as much as 95 percent. Direct impacts to air quality associated with construction activities would be temporary and minor.

Regional Climate

No noticeable direct or indirect impacts to the regional climate would occur as a result of the proposed Project. Local or regional climate effects can occur, for example, with major changes in land use that affect the hydrological cycle, or that create large impervious surfaces, thus changing the radiative heat balance over a large area. The Project would change the surface characteristics somewhat, but it would have little effect on soil permeability and hydrologic characteristics of the developed area. Vegetation would still grow under and around the solar panels, tending to maintain a landscape with significant evapotranspiration of precipitation, as opposed to creating significant runoff of precipitation which happens with urban development. Therefore, average temperatures of the developed area are not expected to change significantly due to the proposed development.

Greenhouse Gases

The use of construction equipment would cause a minor temporary increase in GHG emissions during construction activities. Combustion of gasoline and diesel fuels by internal combustion

engines (trucks and off-road vehicles) at the site would generate emissions of CO_2 and very small amounts of other GHGs such as methane and nitrous oxide. Additional GHG emissions would occur due to transporting materials and workers to the Project Site, and GHGs would be emitted in the US or globally for production and transportation of the materials used for construction. The production of construction materials is expected to represent the largest portion of the Project-related GHG emissions. The total GHG emissions resulting from construction would be entirely offset by Project operation over the long term as the electricity generated by the Project would offset some fossil-fuel-based electricity generation and the GHG emissions associated with the combustion of fossil fuels.

Tree and other tall vegetation removal during construction of the Project would represent a minor loss of sequestered carbon, as well as potential future carbon sequestration. Trees and other tall vegetation currently remove CO_2 from the air and sequester it as biomass. The loss of this carbon sink would constitute a minor adverse direct and indirect impact as sequestration would have continued for the life of the vegetation and long into the future, assuming that other future changes on the Project Site would not result in deforestation. The loss of the carbon sink from tree removal would be at least partially offset by the increased sequestration of CO_2 by the permanent grass-dominated vegetation that would be maintained on the Project Site.

The operation of the Project is not anticipated to have any long-term adverse impacts to air quality or GHG emissions. Operation of the Solar Facility would not produce emissions. Minor emissions would occur during maintenance activities, including facility inspections and periodic mowing. Conversely, overall emissions of air pollutants from the TVA power system would decrease during operation as the nearly emissions-free power generated by the Solar Facility would offset power that would otherwise be generated, at least in part, by the combustion of fossil fuels. The reduction in GHG emissions resulting from the operation of the Solar Facility would have little noticeable effect at regional or larger scales. It would, however, be a component of the larger planned system-wide reduction in GHG emissions by the TVA power system. The adverse impacts of GHG emissions and the beneficial impacts of TVA's efforts to reduce GHG emissions are described in more detail in the TVA IRP (2019).

3.8 Cultural Resources

Cultural resources include, but are not limited to, prehistoric and historic archaeological sites, historic structures, and historic sites at which important events occurred. Cultural resources are finite, non-renewable, and often fragile. They are frequently threatened by industrial, commercial, and residential development, as well as construction of roads and other infrastructure.

The NHPA provides for a national program to support both public and private efforts to identify, evaluate, and protect the nation's important cultural resources. Once identified, these resources are evaluated for inclusion in the NRHP maintained by the National Park Service. Tangible cultural resources may qualify for inclusion in the NRHP if they are 50 years of age or older and if found to possess one or more of four different criteria, in accordance with 36 CFR § 60.4:

- *Criterion A:* association with events that have made a significant contribution to the broad patterns of our history. Such events may include a specific occurrence or pattern of occurrences, cultural traditions, or historic trends important at a local, regional, or national level. To be considered in association with a cultural resource, events must be important within the particular context being assessed.

- *Criterion B:* association with the lives of persons significant in our past. People considered may be important locally, regionally, or nationally, and the cultural resources considered are limited to properties illustrating a person's achievements rather than commemorating them.

- *Criterion C*: embodiment of the distinctive characteristics of a type, period, or method of construction; representative of the work of a master; possessing high artistic values; or representative of a significant and distinguishable entity whose components may lack individual distinction. Cultural resources considered generally include architectural resources such as buildings, objects, districts, and designed landscapes.

- *Criterion D*: cultural resources that have yielded, or may be likely to yield, information important in prehistory or history. Considered cultural resources typically include archaeological sites but may also include buildings, structures, and objects if they are the principal source of important information not contained elsewhere.

Under Section 106 of the NHPA, each federal agency must consider public views and concerns about historic preservation issues when making final project decisions (GSA, 2020). The NHPA addresses the preservation of "historic properties," which are defined under the Act as any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NRHP. Under Section 106 of NHPA, the Project is required to consider ways to avoid or minimize effects from its undertakings on significant cultural resources.

3.8.1 Affected Environment

Phase I archaeological and historic architecture surveys were performed within the Project Site between June 6 through September 17, 2021. The cultural survey area, also referred to as the "APE" included more than 1,837 acres. Additionally, a ½ mile buffer around the Physical APE was developed to account for visual and other non-physical effects from Project implementation (Visual APE). The Visual APE included the Project Site plus an additional ½ acre buffer surrounding the Project Site. The Phase I archaeological resources survey of the Physical APE and the architectural resources survey of the Visual APE and the refined visual effects buffer were conducted between June and September 2021.

The purpose of the Phase I Survey was to identify and document both previously recorded and newly documented archaeological and historic-age non-archaeological resources, to assess their eligibility for listing in the NRHP, and to assess potential Project impacts to historic (NRHP-listed or eligible) properties as required under Section 106 of the NRHP. The surveys were conducted to professional standards and guidelines and in accordance with the *Mississippi Department of*

Archives and History (MDAH), *Mississippi State Historic Preservation Office's* (MSSHPO) *Guidelines for Archaeological Investigation and Reports in Mississippi* (Sims 2001), *the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44742), and in accordance with the *Secretary's Standards for Identification* (48 FR 44720-44723).

Prior to the cultural resource survey field effort, a desktop review was conducted of the Study Area comprising the Physical APE and a 0.5-mile buffer to determine if any previously recorded archaeological sites, architectural resources, and NRHP-listed properties are located in the Study Area. The review involved the evaluation of previously recorded archaeological sites and cultural resources survey data maintained housed at the MDAH – Archaeological Search Room, within the Charlotte Capers Archives and History building in Jackson, Mississippi and the online MDAH Historic Resources Inventory Map Database.

The background research identified three previously recorded archaeological sites within the Study Area (Table 3-9). None of the previously recorded archaeological sites are located within the Physical APE. Two of the previously recorded archaeological sites, 22LO889 and 22LO1082, are unevaluated for listing in the NRHP. The third previously recorded archaeological site, 22LO1085, has been determined not eligible for listing in the NRHP.

Table 3-9: Previously Recorded Archaeological Sites within the Study Area

Site Number	Site Type	Site Component	Name	NRHP Eligibility	Date Recorded
22LO889	Artifact scatter	Mississippian	Tom Hardy #3	Unevaluated	09/24/1987
22LO1082	Artifact scatter	Historic-era	--	Unevaluated	07/13/2020
22LO1085	Artifact scatter/Concrete silo	Historic-era	--	Not eligible	07/11/2020

Source: Mississippi Department of Archives and History (MDAH), January 2020 and April 2021.

Three previous cultural resources surveys have been recorded within the 0.5-mile Study Area (Table 3-10). None of the previous cultural resource surveys cross the Project's Physical APE.

Table 3-10: Previous Archaeological Surveys within the Project Study Area

Report Title	Report Number	Report Author	Date
Cultural Resources Survey of Proposed Widening of U.S. Highway 45A from the Noxubee County Line to U.S. Highway 82 (MDOT Project No. 97-0079-01-018-10), Lowndes County, Mississippi.	95-221	Gray, Bruce J.	June 1995
Cultural Resources Investigations of the Proposed Nickoles Brothers Catfish Farm Tract, Lowndes County, Mississippi.	00-0312	Atkinson, Jerry R.	October 2000

Report Title	Report Number	Report Author	Date
Phase I Cultural Resources Survey for the Golden Triangle I Solar Project, Lowndes County, Mississippi.	--	Shaver, Douglas, et. al.	October 2021

Source: MDAH, January 2020 and April 2021.

TVA initiated consultations on a government-to-government basis with the tribes listed below regarding the Proposed Action's potential to affect historic properties that are of religious and cultural significance to federally-recognized Indian tribes. A summary of TVA's consultations with federally-recognized Tribes is included in Appendix E. None of the consulted tribes identified such properties or objected to the Proposed Action.

- Absentee Shawnee Tribe of Indians of Oklahoma,
- Alabama-Coushatta Tribe of Texas,
- The Chickasaw Nation,
- The Choctaw Nation of Oklahoma,
- Coushatta Tribe of Louisiana,
- Eastern Shawnee Tribe of Oklahoma,
- Jena Band of Choctaw Indians,
- Kialegee Tribal Town,
- Mississippi Band of Choctaw Indians,
- The Muscogee (Creek) Nation,
- Shawnee Tribe, and
- Thlopthlocco Tribal Town

3.8.1.1 Architectural Resources

Review of the MDAH Historic Resources Inventory Map, and previous survey efforts for the GT2 Project adjacent to Golden Triangle I, identified 8 individual resources on 5 parcels within the Non-Physical APE that were determined not eligible for NRHP inclusion (Resources 15, 41a, 41b, 42, 43, and 44a-44c).

The historic-age, non-archaeological resources survey resulted in the documentation of 25 historic-age resources on 7 properties. Of the accessible parcels, 2 properties include resources recommended for NRHP inclusion (Resources 02a and 05a). Two additional resources associated with Resource 05a are recommended as contributing (Resources 05c and 05d). Two resources, Resource 02h (Smith Oaks Plantation cemetery) and Resource 07 (a former African American cemetery) warrant additional NRHP eligibility analysis. The remaining resources are not recommended for NRHP inclusion due to a lack of historic associations, integrity, and/or significance. The NRHP eligible (and contributing) properties and the Smith Oaks Plantation cemetery and the former African American cemetery would not be impacted directly by the Project. Specifically, the resources are removed in distance and shielded by vegetation and other

setting intrusions. As a result, construction of the Project would not affect any of the characteristics that qualify the resources for NRHP inclusion.

The remaining documented resources include primarily mid- to late-twentieth-century Minimal Traditional and Ranch-style dwellings and outbuildings, including barns and sheds, as well as two additional family cemeteries. Other than the properties recommended for NRHP inclusion, none of the remaining resources recorded during the survey, either individually or collectively, appear to meet the criteria for NRHP inclusion due to a lack of significance and/or architectural integrity.

3.8.1.2 Archaeological Resources

During fieldwork for the Phase I archaeological resources survey of the Physical APE, 27 newly identified archaeological sites, of which 15 are isolated finds consisting of a single artifact or a site with three or less similar artifacts within a single shovel test, were recorded. Of the 15 isolated find sites, four are precontact Native American finds and eleven are historic-era. One of the precontact Native American isolated finds, IF-DS-1, consists of a Late Archaic Smithsonia or Flint Creek type projectile point, while IF-DS-7 consists of a Late Archaic Ledbetter or Flint Creek-Pontchartrain Plano-convex knife. None of the isolated find sites are recommended eligible for inclusion in the NRHP. None of the isolated find sites are recommended for avoidance by Project implementation.

The other newly identified non-isolated find archaeological sites include 11 historic-era sites and one precontact Native American site. One of the newly identified sites, field site 22LO1100 (DS2), has been identified as a Late Archaic through Late Woodland period precontact Native American occupation / camp site artifact scatter. Site 22LO1100 (DS2) is recommended as unevaluated for inclusion in the NRHP and will be avoided by Project implementation. Two newly identified sites, 22LO1114 (DS4) and 22LO1098 (CW1) are historic scatters with intact features. 22LO1114 (DS4) was identified through shovel tests excavations, with one shovel test uncovering a burn feature. 22LO1098 (CW1) is an occupation site with an intact cistern and small brick lined foundation. Both sites are associated with structures depicted on a historic 1911 Soils Map of Lowndes County. Both 22LO1114 (DS4) and 22LO1098 (CW1) are recommended as unevaluated for inclusion in the NRHP and will be avoided by Project implementation.

Site 22LO1117 (DS7) is an extant portion of the Smith Oaks harness horse racing track. The 0.5-mile dirt track was constructed by Thomas Wilburn II in the late 1940s or early 1950s. Wilburn was a professional Standardbred horse trainer and harness horse racing champion who was inducted in the Illinois Harness Horse Racing Hall of Fame, was the 1991 Mississippi Cattleman of the Year, and is a direct descendant of John McLaughlin Smith, the original plantation owner.

3.8.2 Environmental Consequences - Cultural

3.8.2.1 No Action Alternative

Under the No Action Alternative, existing land use would be expected to remain unchanged. Ground-disturbing industrial agricultural practices currently carried out through portions of the site

would continue to have the potential to impact intact cultural resources at the surface or within the first 8 to 10 inches of soil. The impact of livestock within newly recorded archaeological sites was noted during the cultural resources survey. Livestock will continue to have a negative impact on cultural resources at the site. If the site were instead redeveloped for residential, commercial, or industrial land uses, then more significant impacts to existing or potential cultural resources would be expected.

3.8.2.2 Proposed Action

A total of 25 historic-age non-archaeological resources on 7 properties were recorded during the Phase I cultural resources survey, in addition to 8 individual resources on 5 parcels within the Non-Physical APE that were previously evaluated as part of the MS Solar 5 Project cultural resources survey. Of the accessible resources within the current survey, two properties (the Smith Oaks Plantation former commissary [Resource 02a] and the Oakland Plantation dwelling [Resource 05a] are recommended for NRHP inclusion, and two individual resources associated with the Oakland Plantation (Resources 05c and 05d) are recommended as contributing. Two additional resources would require additional NRHP analysis to confirm their eligibility status (the Smith Oaks Plantation Cemetery [Resource 02h] and a former African American cemetery [Resource 07]. The resources recommended for NRHP inclusion and of undetermined NRHP eligibility status would not be adversely affected by the Project. Specifically, the resources are removed in distance and shielded by vegetation and other setting intrusions. As a result, construction of the Project would not affect any of the characteristics that qualify the resources for NRHP inclusion.

None of the remaining resources recorded during the survey, either individually or collectively, appear to meet the criteria for NRHP inclusion due to a lack of significance and/or architectural integrity. As no historic (NRHP-eligible or listed) resources would be physically or otherwise adversely affected by the proposed Project, no further consideration of effects to historic properties under Section 106 of the NHPA is recommended in connection with the Project as currently proposed.

Twelve newly identified archaeological sites and fifteen isolated finds were encountered within the Physical APE during the Phase I cultural resource surveys. One of the twelve newly identified sites, 22LO1117 (DS7) is recommended eligible for inclusion in the NRHP, while three newly identified archaeological sites are to remain unevaluated.

Site 22LO1117 (DS7), the Thomas Wilburn II harness horse racing track is recommended eligible for inclusion in the NRHP under Criteria A and B. Wilburn constructed the track in the late 1940s or early 1950s and trained 1,667 Standardbred racehorses at this location. Some of whom were sold to influential families, including the Hunts and Mellons. Until his retirement from horse racing in 1974, Wilburn won over 2,000 races throughout the United States and Canada, eventually being inducted into the Illinois Harness Horseracing Hall of Fame. According to local informants, when Wilburn held races at his track, which is one of the ways he marketed his horses to potential buyer, upwards of 5,000 people, both local and from far away, would attend. Wilburn was significant in the world of harness horse racing and the horse racing community; his races and

influence was significant within the local and regional communities; and much can be learned from how he constructed and maintained his track.

The Wilburn racetrack represents a track whose primary use was training and marketing, as opposed to a strictly spectator event location. Roughly two-thirds of the track is currently located in the Physical APE and is under heavy vegetation. The portion that is outside of the Physical APE is maintained and covered in short grasses. The portion outside of the Physical APE has not been investigated for cultural material, though any recommendation for inclusion in the NRHP should include the entirety of the racetrack. The portion of the harness horse racing track within the Physical APE will be avoided by project implementation. A 100-foot avoidance buffer has been placed around 22LO1117 (DS7).

Three newly identified archaeological sites are recommended unevaluated for inclusion in the NRHP. Two of the sites are historic occupations that are depicted on the 1911 Soils Map. 22LO1118 (CW1) is a moderate historic scatter and extant features located within a wooded area. The extant features include a cistern, that has been filled with cinder blocks, bricks and rubbish, and a small brick lined foundation. Site 22LO1119 (DS4) is a subsurface historic scatter located in a mowed hayfield at the time of survey. One shovel test indicated an intact burn feature. It is unknown if the sites are associated with tenant farms or descendants of the original plantation owners. Information gained from either site could provide valuable insights into the lifeways and land use by farmers in rural Mississippi during the Reconstruction period to post-Depression era. Both sites will be avoided by direct impacts from the Project. A 100-foot avoidance buffer has been placed around 22LO1118 (CW1) and 22LO1119 (DS4).

The third unevaluated site is 22LO1120 (DS2), identified as a Late Archaic and Late Woodland period precontact Native American occupation / campsite, and is located in an active agricultural field that has only been in use since 2017. The site consists of twenty-six lithic artifacts and a single sand tempered pottery sherd. Of the twenty-six lithic artifacts four are diagnostic projectile points or knives. The projectile points / knives include a likely Flint Creek projectile point, a Baker's Creek projectile point, a partial Dehli or Smithsonian projectile point, and a Variety Russel of the Nodena point type. All lithic material from 22LO1120 (DS2) appears to be from heat treated Tuscaloosa Gravels. Since the location of 22LO1120 (DS2) has only been utilized for agriculture for a relatively short period of time, since 2017, it is likely that there have been minimal impacts to any potential, not discovered, subsurface features. For this reason, site 22LO1120 (DS2) is recommended as unevaluated for inclusion in the NRHP. DS2 will be avoided by direct impacts from the Project. A 100-foot avoidance buffer has been placed around 22LO1120 (DS2).

The remaining 8 newly identified archaeological sites and 15 isolated find locations within the Physical APE are recommended not eligible for inclusion in the NRHP. No further archaeological investigations area recommended at these locations.

Throughout the Section 106 consultation process, if it is determined that the Project would result in an adverse effect on cultural resources, the Project would be redesigned to avoid affected sites so that MS Solar 6 would not need to mitigate for impacts through an MOA process. Therefore,

there would be no direct or indirect impacts to archaeological or historic resources listed eligible, potentially eligible, or undetermined for the NRHP. TVA is consulting with the SHPO and federally recognized Indian tribes with an interest in the area with respect to TVA's findings of both the archaeological and architectural surveys.

Should previously undiscovered cultural resources be identified during Site construction or operations, construction in the affected area will be immediately stopped and the discovery location secured against further disturbance, pending completion of consultation with appropriate stakeholders. TVA and the SHPO would be consulted before any further action were taken.

3.9 Utilities

This section describes an overview of existing utilities within the Project Site and the immediate surrounding area and the potential impacts on these utilities that would be associated with the No Action and Proposed Action Alternatives. Specific utility components analyzed below include telecommunications, electricity, natural gas, water, and sewer.

3.9.1 Affected Environment

The Project Site is located on farmland in a rural area of Lowndes County, Mississippi. Available power sources to the county residents are electricity and natural gas. No significant renewable energy sources are currently located in this area.

3.9.1.1 Telecommunications

Telecommunication services in the area are provided primarily by Franklin Telephone Company and Bellsouth Telecommunications, as well as mobile providers.

3.9.1.2 Electricity

The local electricity provider for most of Lowndes County as well as the adjacent counties is 4-County Electric Power Association (4CEPA), a not-for-profit electric cooperative that purchases power generated by TVA. A TVA-owned transmission line traverses the Project Site, cutting east-west across the northern portion of the site (see Figure 2-2). Distribution lines are present throughout the area, including along portions of Gilmer-Wilburn Road and other major and minor roads in the vicinity.

3.9.1.3 Natural Gas

Natural gas service in the vicinity is provided by Atmos Energy, which owns a natural gas pipeline that taps the Southern Natural Gas pipeline at a meter station located on a parcel that abuts the Golden Triangle I Solar and BESS Project Site.

3.9.1.4 Water and Sewer

Because the Project Site is predominantly outside of incorporated municipality limits, water service is provided either by the Prairie Land Water Association or through private wells, and sewer service is provided through private septic systems. No known public service water lines or line markers servicing individual customers were observed on the Project Site. The residents

located adjacent to the Project Site may have water service from Prairie Land Water Association or other public utility companies.

3.9.2 Environmental Consequences - Utilities

This section describes the potential impacts to utilities should the No Action or Proposed Action Alternatives be implemented.

3.9.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed; therefore, there would be no Project-related impacts to utilities. Existing land use would be expected to remain a mix of agricultural and forested land, and existing on-site utilities would likely remain unchanged, with the exception of potential upgrades and maintenance.

3.9.2.2 Proposed Action

Under the Proposed Action, minimal temporary impacts to local electricity service could be expected when bringing the Solar Facility on-line or during routine maintenance of the facility. Once the Project enters the operation phase, 4-County Electric Power Association (4CEPA) would provide the required back-up power for controls. Based on discussions with 4CEPA and given the low level of retail electric demand needed for the facility, no changes to the 4CEPA distribution system would be expected, and there would be no impacts to the local utility or its customers. Implementation of the Proposed Action would result in additional renewable energy resources in the region, which would augment total electricity supply and constitute an improvement to the environmental impacts associated with regional electricity generation.

Water would be needed for soil compaction and dust control during construction, and to a lesser extent for domestic use during operations (i.e., cleaning solar panels if drought conditions persisted). There would be no habitable buildings on-site and no need for potable water. Portable toilet facilities would be available on-site for the duration of the construction period; there would be no need for a septic system or connection to the closest sanitary sewer. Water in sufficient quantity and quality would be made available through use of on-site groundwater wells, or delivery via water trucks. MS Solar 6's construction contractor would determine daily water requirements based on the preliminary grading plan and size the new on-site wells accordingly. MS Solar 6's construction contractor would perform groundwater drilling and testing work prior to full construction to generate data on aquifer characteristics and develop a plan for the production well design. If existing groundwater wells are available and needed, they would be utilized for the Project; the exact location of which would be identified in the final design. The wells would be spaced around the Project Site to provide easy access for construction water and to reduce the potential for any significant water level drawdown.

Natural gas service would not be required for the Project, and the existing natural gas infrastructure present near GT2 would not be disturbed or otherwise impacted during the construction or operation of the Project.

No communication resources are anticipated to be acquired through the local providers. MS Solar 6 would have a dedicated communications system to remotely monitor the Project facility and operations.

No long-term adverse impacts to utilities would be anticipated as a result of implementation of the Proposed Action. No indirect impacts to utilities would occur under the Proposed Action. The Proposed Action would result in a new source of renewable energy for the region; thus, the Project would ultimately contribute to a beneficial impact to electrical services across the region.

3.10 Waste Management

This section provides an overview of existing waste management within the surrounding area of the Project Site and the potential impacts to waste management that would be associated with the No Action or Proposed Action Alternatives. Components of waste management that are analyzed include solid and hazardous waste and materials.

3.10.1 Affected Environment

"Hazardous materials" and "hazardous waste" are substances which, because of their quantity, concentration, or characteristics (physical, chemical, or infectious), may present a significant danger to public health and/or the environment if released. These substances are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 U.S.C. §§ 9601 *et seq.*) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act ([RCRA]; 42 U.S.C. §§ 6901 *et seq.*). Regulated hazardous wastes under RCRA include any solid, liquid, contained gaseous, or semisolid waste or combination of wastes that exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or is listed as a hazardous waste under 40 CFR part 261. Storage and use of hazardous materials and wastes are regulated by local, state, and federal guidance including the Emergency Planning and Community Right-to-Know Act (42 U.S.C. §§ 116 *et seq.*) and RCRA.

Because the current land use of the Project Site is entirely either agricultural or undeveloped, no known hazardous waste exists on the site, and none is anticipated aside from potential petroleum, pesticides, herbicides, or fertilizers that can be removed as part of the construction process.

Collection and disposal of solid waste in Lowndes County is conducted by Golden Triangle Waste Services. Nonhazardous wastes, including construction wastes, can be hauled to an operating Class I facility.

3.10.2 Environmental Consequences

This section describes the potential impacts to waste management resources should the No Action or Proposed Action Alternatives be implemented.

3.10.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed; therefore, no Project-related impacts to waste management resources would occur. Existing land use would

be expected to remain a mix of agricultural and undeveloped land, and existing waste management conditions would be expected to remain as they are at present.

3.10.2.2 Proposed Action

Construction of the Proposed Action would result in the generation of hazardous and nonhazardous solid waste in the form of construction debris, grading spoils, packaging materials, and general construction waste. Under the Proposed Action, every effort would be made to minimize the amount of waste generated during and after construction of the Project.

Materials suitable for soil compaction are anticipated to be procured from within the Project Site as needed and off-loaded at the designated road or building location for immediate dispersion. Materials unsuitable for compaction, such as mowed debris, would be removed and loaded immediately for subsequent disposal at an acceptable off-site location. Contaminated grading and mowing materials are not anticipated; however, if any such materials are encountered during excavation, they would be disposed of at the nearest appropriate facility in accordance with applicable laws, ordinances, regulations, and standards. It is estimated that not more than 20 cubic yards of construction debris and material waste would be generated each week (during heavier periods of construction), which would be accumulated in a construction debris container and hauled off monthly. A list of acceptable waste facilities is listed in Table 3-11.

Table 3-11: Waste Facilities Near the Project Site

Landfill	Address	Materials
Columbus Landfill	2221 Armstrong Rd, Columbus, MS 39702	Class I rubbish landfill for yard waste, construction debris, and furniture/appliances.
Golden Triangle Regional Solid Waste Management Authority	9778 Old West Point Rd, Starkville, MS 39759	Household garbage, mixed building debris, vegetative debris, commercial wastes, office wastes, packaging wastes and other non-hazardous solid wastes.

Hazardous Waste

Small quantities of hazardous wastes would be generated during construction, operation and maintenance, and decommissioning of the Project. Hazardous wastes generated during the construction phase would include substances such as paint and primer, thinners, and solvents. Hazardous solid and liquid waste streams that would be generated during operation of the Project include substances such as used hydraulic fluids, used oils, greases, filters, etc., as well as fluorescent light bulbs, spent cleaning solutions, and spent batteries. Hazardous wastes generated during decommissioning would include substances such as carbon dioxide, diesel fuel, hydraulic fuel, and lube oil. To the extent practicable, hazardous wastes would be recycled. Waste collection and disposal would be conducted in accordance with applicable federal, state, and local regulatory requirements to minimize health and safety effects.

MS Solar 6 (or its contractor) would report any spills to MDEQ. A sampling and cleanup report would be prepared and sent to the agency to document each spill and clean up. Each spill, regardless of amount, would be cleaned up within 48 hours and a spill report completed. Copies of spill and cleanup reports would be kept on-site.

Minimal amounts of petroleum fuel would be kept on-site during construction. BMPs would be implemented in order to minimize the potential of a spill and to instruct on-site workers on how to contain and clean up any potential spills. The Project Site would be surrounded by security fencing during both construction and operational phases and access gates would normally remain locked. General public health and safety would not be at risk in the event of an accidental spill on-site.

During construction, hazardous materials would be stored on-site in storage tanks, vessels, or other appropriate containers specifically designed for the characteristics of the materials to be stored. The storage facilities would include secondary containment in case of tank or vessel failure. Construction- and decommissioning-related hazardous materials used for development of the Project could include gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paints. Material Safety Data Sheets for applicable materials present on-site would be made readily available to on-site personnel.

Fueling of some construction vehicles and other mobile equipment would occur primarily in the construction laydown area. Special procedures would be identified to minimize the potential for fuel spills, and spill control kits would be carried on refueling vehicles for activities such as refueling, vehicle or equipment maintenance procedures, waste removal, and tank clean-out. Fuel for construction equipment could be provided by a fuel truck or could be stored in aboveground double-walled storage tanks with built-in containment. The volume of each individual tank would not exceed 1,320 gallons, the threshold above which a Spill Prevention, Countermeasure and Control (SPCC) Plan would be required (40 CFR 112). However, because there would be fuel in reserve for diesel generators, in addition to the volume of oil contained in the main electrical transformers, the total volume of regulated materials may exceed the threshold. In that case, an SPCC Plan would be prepared.

The SPCC Plan would include procedures, methods, and equipment supplied during construction to prevent discharges from reaching navigable waters. The facility would fall under USEPA's SPCC applicability as a Tier I Qualified Facility. Because oil storage would consist of only "oil-filled operational equipment," double-walled protection would not be required [40 CFR 112.7(k)(2)] and the SPCC Plan would not have to be certified by a Professional Engineer [40 CFR 112.3(g)]. The SPCC plan would be prepared and implemented prior to and during construction to prevent oil discharges during facility operation. The administering agency is the EPA.

At the end of its useful life, the Project facilities would be decommissioned and dismantled, restoring the site. During decommissioning, above ground equipment and below ground electrical connections would be removed from the Project Site. In addition, concrete pads and foundations would be broken and removed, underground utilities would be abandoned, compacted areas would be scarified, and soils would be stabilized. The majority of decommissioned materials and

equipment would be recycled. MS Solar 6 would seek a processor to recycle the solar panels to the highest degree practicable. Materials that cannot be recycled would be disposed at approved facilities in accordance with applicable federal, state, and local laws and regulations. Alternatively, the Project facilities may be repurposed for new solar technologies available at the end of the plant lifecycle, where equipment, cabling, and foundations would be re-used where practicable. Hazardous materials that could be present during construction and decommissioning of the Proposed Action are included in Table 3-12.

Table 3-12: Summary of Special Handling Precautions for Large Quantity Hazardous Materials

Hazardous Material	Use	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Diesel Fuel	Equipment Generator refueling and emergency diesel fire pump	Low toxicity; Hazard class – combustible liquid	PEL; none established TLV: 100 mg/m^3	Carbon steel tank (3,600 gallons)	Secondary containment, overfill protection, vapor recovery, spill kit.
Hydraulic fluid (if applicable)	Tracker drive units	Low to moderate toxicity; Hazard class – Class IIIB combustible liquid	TWA (oil mist); 5 mg/m^3 STEL: 10 mg/m^3	Hydraulic drive tank, approx. 20 gallon per tracker drive unit (if applicable) throughout solar field. Carbon steel tank, maintenance inventory in 55-gallon steel drums.	Found only in equipment with a small maintenance inventory. Maintenance inventory stored within secondary containment, alternative measures to secondary containment for equipment would be implemented at the Project.
Lube Oil	Lubricate rotating equipment (*e.g.*, tracker drive units)	Low toxicity Hazard class – N/A	None established	Carbon steel tank, maintenance inventory in 55-gallon steel drums.	Secondary containment for tank and for maintenance inventory.

PEL = permissible exposure limit
TLV = threshold limit value
TWA = time weighted average
STEL = short-term exposure limit

[1]Low toxicity is used to describe materials with an NFPA Health rating of 0 or 1. Moderate toxicity is used to describe materials with an NFPA rating of 2. High toxicity is used to describe materials with an NFPA rating of 3. Extreme toxicity is used to describe materials with an NFPA rating of 4.
[2]N/A denotes materials that do not meet the criteria for any hazard class defined in the 1997 Uniform Fire Code.

In addition to the chemicals listed above, small quantities (less than 55 gallons, 500 pounds or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint, degreasers, herbicides, pesticides, air conditioning fluids (chlorofluorocarbons), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the facility. Flammable materials (e.g., paints, solvents) would be stored in flammable material storage cabinet(s) with built-in containment sumps. Due to the small quantities involved

and the controlled environment, a spill could be cleaned up without significant environmental consequences.

MS Solar 6 would develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials (e.g., Hazardous Material Business Plan). Facility personnel would be supplied with appropriate personal protective equipment (PPE) and would be properly trained in the use of PPE as well as the handling, use, and cleanup of hazardous materials used at the facility and the procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials would be stored on site.

Non-hazardous Waste Management

Construction, operation, and maintenance, and decommissioning of the Project would generate non-hazardous solid wastes. Facility-related wastes generated during all phases of the Proposed Action would include soiled rags, worn or broken metal and machine parts, defective or broken electrical materials, other scrap metal and plastic, insulation material, empty containers, cardboard, glass, wood/pallets, and other miscellaneous solid wastes including the typical refuse generated by workers. These materials would be disposed of by means of contracted refuse collection and recycling services. Waste collection and disposal would be in accordance with applicable federal, state, and local regulatory requirements to minimize health and safety effects, and no waste would be treated on site during construction or operations. Designated contractor and subcontractor personnel would be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced. Disposal containers such as dumpsters or roll-off containers would be obtained from a proper waste disposal contractor. Records of the amounts generated would be provided to MS Solar 6. Information on universal wastes anticipated to be generated during Project construction is provided in Table 3-13.

Table 3-13: Summary of Construction Waste Streams and Management Methods

Waste Stream	Origin and Composition	Estimated Frequency of Generation	On-site Treatment	Waste Management Method / Offsite Treatment
Construction waste	Empty material containers	Intermittent	None	Return to vendor
Construction Waste	Used oil, hydraulic fluid, oily rags	Intermittent	None	Recycle wherever practicable, remove to off-site disposal location
Construction Waste	Steel, glass, plastic, wood/pallets, cardboard, paper	Intermittent	None	Recycle wherever practicable, otherwise dispose of at a class I landfill
Sanitary waste	Portable chemical toilets – sanitary waste	Periodically pumped to tanker truck by licensed contractors	None	Ship to sanitary wastewater treatment facility.

The anticipated quantities of waste produced during Project operation are summarized in Table 3-14. Universal wastes and unusable materials produced as a result of implementation of the Proposed Action would be handled, stored, and managed in accordance with Mississippi Universal Waste requirements.

Table 3-14: Summary of Operational Waste Streams and Management Methods

Waste Stream	Origin and Composition	Estimated Volume	Estimated Frequency of Generation	Waste Management Method	
				Onsite	Offsite
Used hydraulic fluid, oils, and grease-petroleum-related wastes	Tracker drives, hydraulic equipment	1,000 gallons/year	Intermittent	Accumulate for <90 days	Recycle
Oily rags, oil absorbent, and oil filters – petroleum-related wastes	Various	One 55-gallon drum/month	Intermittent	Accumulate for <90 days	Send offsite for recovery or disposed at Class I landfill
Spent batteries	Lead acid/lithium ion	1,000	Every 10 years	Accumulate for <90 days	Recycle

Waste collection and disposal would be conducted in accordance with applicable federal, state, and local regulatory requirements to minimize health and safety effects. To the extent practicable, waste would be recycled. Materials that could not be recycled would be disposed of at an approved facility to be determined by the designated contractor(s) in accordance with applicable federal, state, and local laws and regulations. No waste oil would be disposed of on the Project Site.

If necessary, MS Solar 6 or its contractor would obtain a hazardous waste generator identification number from the State of Mississippi prior to generating any hazardous waste. Any spills related to the Project would be reported to MDEQ's Emergency Response Division. A sampling and cleanup report would be prepared for the Project Site and sent to MDEQ to document each spill and clean up. Each spill, regardless of amount, would be cleaned up within 48 hours and a spill report would be completed. Copies of any spill and cleanup reports would be kept on site.

Designated contractor and subcontractor personnel would be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced. Disposal containers such as dumpsters or roll-off containers would be obtained from a proper waste disposal contractor. Records of the amounts generated would be provided to the designated Solar Facility environmental specialist.

3.11 Public and Occupational Health and Safety

This section describes an overview of existing public health and safety at the Project Site and the potential impacts to public health and safety associated with the No Action and Proposed Action Alternatives. Analyzed issues include emergency response and preparedness and occupational

or worker safety in compliance with the Occupational Safety and Health Administration (OSHA) standards.

3.11.1 Affected Environment

The Project Site is currently private property, with a predominant land use activity of agricultural and livestock. Public emergency services in the area include fire protection services, law enforcement services, urgent care clinics, and hospitals. Fire protection services are provided by the Columbus Fire Department and the Starkville Fire Department, located approximately 15 miles (20 minutes) and 11 miles (16 minutes), respectively, from the Project Site. Law enforcement services in the City of Starkville are provided by the Starkville Police Department. Lowndes County law enforcement services are provided by the Lowndes County Sheriff's Department in Columbus, approximately 12 miles (17 minutes) northeast of the Project Site. The State Urgent Care Center, located on South Montgomery Street, approximately 11 miles (16 minutes) northwest of the Project Site, is the closest urgent care center to the Project Site. The North Mississippi Medical Center is the closest hospital, located in West Point approximately 16 miles (19 minutes) north of the Project Site. The Mississippi Emergency Management Agency has the responsibility and authority to coordinate with state and local agencies in the event of a release of hazardous materials.

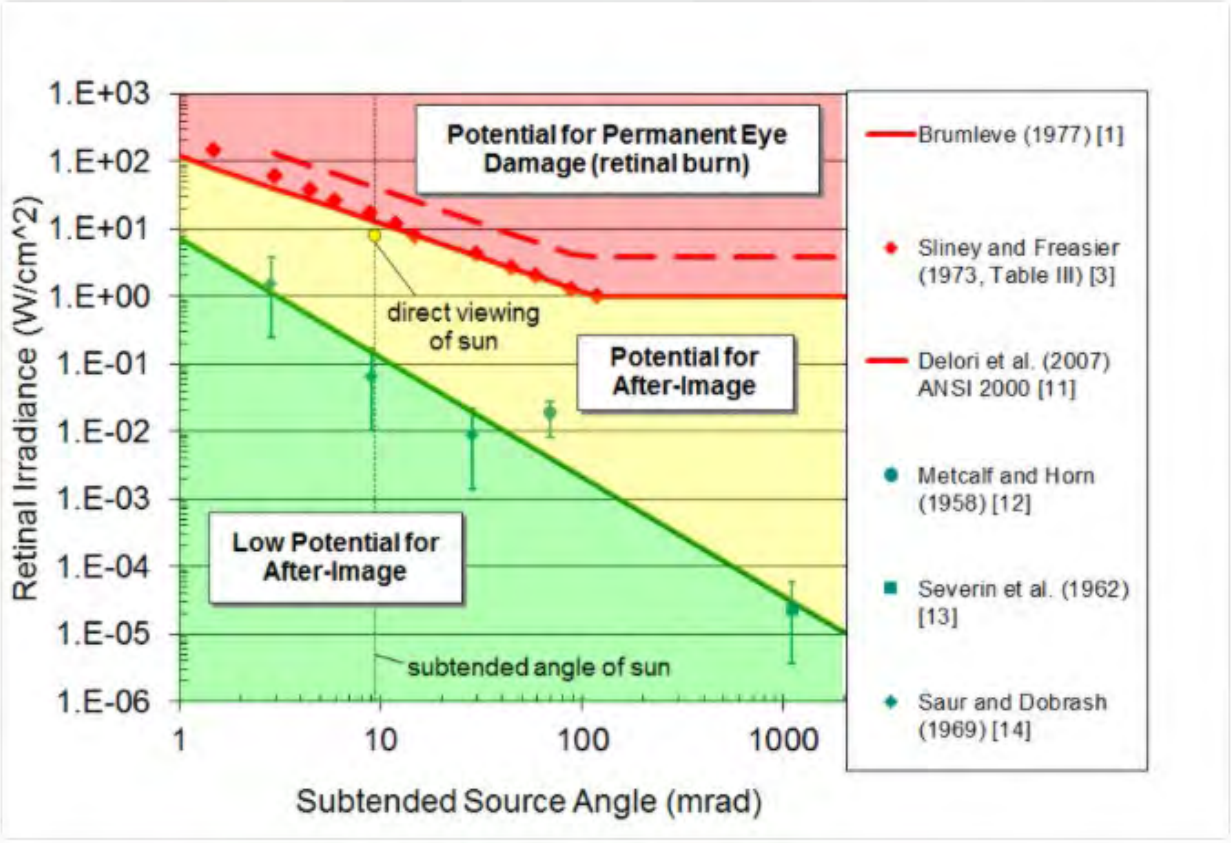
Glint and Glare

Glint is typically defined as a momentary flash of bright light, often caused by a reflection off a moving source. A typical example of glint is a momentary solar reflection from a moving car. Glare is defined as a continuous source of bright light. Glare is generally associated with stationary objects, which, due to the slow relative movement of the sun, reflect sunlight for a longer duration. The difference between glint and glare is duration. Industry-standard glare analysis tools evaluate the occurrence of glare on a minute-by-minute basis; accordingly, they generally refer to solar hazards as "glare" (ForgeSolar 2021).

Due to the proposed Project's proximity to the GTR Airport, a glare analysis was performed in accordance with Federal Aviation Administration (FAA) standards. To understand and model glare in accordance with FAA's standards, Sandia National Laboratories developed the Solar Glare Hazard Analysis Tool (SGHAT). To perform the glare analysis for this study, the SGHAT, as licensed to ForgeSolar, was utilized (ForgeSolar 2021). The SGHAT allows the user to specify a site location, draw an outline of the proposed photovoltaic array, and specify observer locations. Once these points are given, the properties of the arrays such as the tracking type, tilt, module surface type, and orientation can be specified as well for each array. Latitude, longitude, and elevation for each observation point and array vertex are tracked and used for sun position and vector calculations to determine glare for that observation point. Additional information regarding reflectance, environment, and ocular factors can be altered; however, typical values were already provided.

The ocular impact of glare is visualized with the Solar Glare Ocular Hazard Plot (SGOHP). This chart displays the ocular impact as a function of glare subtended source angle and retinal

irradiance. Each minute of glare is displayed on the chart as a small circle in its respective hazard zone. For convenience, a reference point is provided which illustrates the hazard from viewing the sun without filtering, i.e., staring at the sun. Each plot includes predicted glare for one PV array and one receptor (ForgeSolar 2021).



Source: ForgeSolar 2020

Figure 3-13: Solar Glare Ocular Hazard Plot

If glare is found, the SGHAT calculates the retinal irradiance and size/distance of the glare source, defines how many minutes of "green glare," "yellow glare," and "red glare" exist at each observation point, and produces the SGOHP. Other results from the SFHAT are a plot that specifies when glare would occur throughout the year and at what times with color codes indicating the potential ocular hazard.

The FAA established an interim policy in 2013 relating to glare from solar projects. The FAA determined that for pilots, no yellow or red glare is allowable on approach, green glare is acceptable on approach, and there are no restrictions for when regularly flying the plane. See below for exact wording on page 2 of Federal Register / Vol. 78, No. 205 / Wednesday, October 23, 2013 / Notices:

> "No potential for glare or "low potential for afterimage" along the final approach path for any existing landing threshold or future landing thresholds (including any

planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath" (FAA, 2013).

3.11.2 Environmental Consequences

This section describes the potential impacts to public and occupational health and safety if the No Action or Proposed Action Alternatives is implemented.

3.11.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed; therefore, no Project-related impacts on public health and safety would result. Existing land use would be expected to remain a mix of agricultural and pastureland, and existing public health and safety issues would be expected to remain as they are at present.

3.11.2.2 Proposed Action

Based on typical hazards associated with construction, workers on the Project Site would have an increased safety risk during construction. Due to increased safety risks associated with construction, standards such as those developed by OSHA would be implemented to maintain health and safety on all construction sites. Health and safety plans in compliance with OSHA standards outline and implement BMPs for site safety management in efforts to minimize potential health and safety risks to workers. BMPs include initial site safety orientations for all personnel on-site; development of work procedures and programs for site specific activities; use of equipment safety measures, emergency stop-work procedures, lockout and tag out procedures, general site housekeeping, and personal protective equipment; safety inspections; and plans and procedures to identify and resolve potential safety hazards.

Fuel for construction vehicles may be stored on-site during construction. An SPCC plan would be developed and implemented to minimize the potential of a spill and would include detailed instructions for on-site personnel on how to contain and clean up any potential spills. Any hazardous materials stored within the Project Site during construction would be secure and not accessible to the general public. General public health and safety would not be at risk in the event of an accidental spill on site. Emergency response for any potential incidents at the Project Site would be provided by the local, regional, and state law enforcement, fire, and emergency responders, as described in the prior section.

A minor increase in potential public health and safety hazards could result from increased traffic on local roadways during construction of the Project. The few residential sites along roadways used by construction traffic to access the Project Site would experience increased commercial and industrial traffic during construction. Established traffic procedures and awareness of these residences would be implemented in the health and safety plans to minimize potential safety concerns associated with the temporary increase in traffic.

No public health or safety hazards would be anticipated from operation of the Solar Facility. Impacts to public health and safety associated with implementation of the Proposed Action would be temporary and minor.

Results of the Glare Analysis

Burns & McDonnell performed a Solar Glare Ocular Impact Analysis for the proposed Project to demonstrate that any glare created from the Project would not adversely impact surrounding properties, vehicles traveling on roadways near the Project Site, or pilots approaching the GTR airport. As part of the analysis, observation points were identified, SGHAT Analysis was performed, Line-of-Sight Analysis was performed, View Angle Analysis was performed, and a landscape review was performed.

The intent of the analysis was not to illustrate that all potential glare has been removed, but to identify the glare that could exist and determine if the glare would adversely impact surrounding properties, vehicles traveling along nearby roadways, or pilots approaching the GTR airport. It was found that the Project would not produce any glare that could cause permanent eye damage due to retinal burn. Potential glare at all observation points was categorized as having low potential for afterimage (designated as green glare) or having potential for afterimage (designated as yellow glare). Based on the SGHAT results, onsite visual observations, a view angle analysis, and reviews of the landscaping, it was found that no observation points have or would have potential glare to adversely impact surrounding properties near the Project Site.

3.12 Socioeconomics

This section describes an overview of existing socioeconomic conditions near the Project Site, and the potential impacts to socioeconomic conditions that would be associated with the No Action and Proposed Action Alternatives. Components of socioeconomic resources presented include population, demographics, employment, and income.

3.12.1 Affected Environment

The proposed Solar Facility would be located within an unincorporated portion of Lowndes County, Mississippi. The Project Site is entirely in U.S. Census Tract (CT) 2808733.07. The total population for Lowndes County, as reported by the U.S. Census Bureau (USCB), was 59,779 in 2010 and an estimated 59,150 in 2019 (USCB, 2021a). Top employment industries for Lowndes County are education, healthcare and social services, manufacturing, and retail trade (USCB, 2021b). Lowndes County offers residents and visitors access to activities and attractions such as museums, campgrounds, biking trails, and a historic welcome center (Lowndes, 2021a).

Columbus is the county seat to Lowndes County and is the only major city in the county. Lowndes County is comprised of three towns, including Artesia, and several communities including Mayhew (Lowndes, 2021b). In 2019, Lowndes County had a labor force of approximately 27,731 with 24,392 employed and 2,142 unemployed civilians. The unemployment rate was an estimated 8.1 percent. By comparison, the unemployment rate for the state of Mississippi was an estimated 7.5%. The median household income in Lowndes County was $50,441. Seventeen percent of

households in Lowndes County made between $50,000 to $74,999 in income and benefits. By comparison, the median household income in Mississippi was $45,081 and 16.8 percent of households made between $50,000 to $74,999 in income and benefits (USCB, 2021b).

3.12.2 Environmental Consequences

This section describes the potential impacts to socioeconomic resources should the Proposed Action or No Action Alternatives be implemented. Social and economic issues considered for evaluation within the impact area include change in expenditures for goods and services and short- and long-term effects on employment and income.

3.12.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed. Therefore, there would be no Project-related socioeconomic impacts within Lowndes County, including the beneficial impacts to local population, employment, and land value associated with the proposed Project.

3.12.2.2 Proposed Action

Under the Proposed Action, a new solar facility would be built at the Project Site. Minor adverse indirect impacts could occur on the agricultural economy of the region due to the loss of up to 495 acres of annual soybean and corn production. MS Solar 6 would be leasing the parcels for the Solar Facility which results in a higher lease payment to the landowner than agricultural production does. However, the loss of agricultural land would adversely impact the farmers working the land as well as other services that support agricultural production. These impacts would be minimal, and the economic benefit of the Project would outweigh the adverse impacts substantially.

Construction activities at the Project Site would take approximately 17 months to complete with a crew of approximately 200 to 300 workers at the site, depending on construction activities. Workers would include general laborers and electrical technicians. Work would generally occur seven days a week during daylight hours. Short-term beneficial economic impacts would result from construction activities associated with the Project, including the purchase of materials, equipment, and services and a temporary increase in employment and income. This increase would be local or regional, depending on where the goods, services, and workers were obtained. It is likely some construction materials and services would be purchased locally in Lowndes County and/or in adjacent counties. Most of the other components of the solar and transmission facilities would be acquired from outside the local area. Also, most of the construction workforce would be sought locally or within the region, while a small portion of the construction workforce might come from out of the region. The direct impact on the economy associated with construction of the Project would be short-term and beneficial.

The majority of the indirect employment and income impacts would be from expenditure of the wages earned by the workforce involved in construction activities, as well as the local workforce used to provide materials and services. Construction of the Project could have minor beneficial

indirect impacts to population and short-term impacts to employment and income levels in Lowndes County.

During operation of the Solar Facility, a full-time workforce of up to two people would be on site five days a week from 7 A.M. to 5 P.M. This workforce would manage and maintain the Solar Facility and conduct regular inspections. Grounds maintenance and some other operation and maintenance activities may be conducted by local contractors. Therefore, operation of the Solar Facility would have a small positive impact on employment and population in Lowndes County.

Overall, socioeconomic impacts for the operation of the proposed Solar Facility would be positive and long-term, but small relative to the total economy of the region. The local tax base would increase from construction of the Solar Facility and would be most beneficial to Lowndes County and the vicinity. Additionally, the local governments would not have to provide any of the traditional government services typically associated with a large capital investment, such as water, sewer, or schools.

3.13 Environmental Justice

This section provides an overview of environmental justice considerations within the Project Area and the potential impacts to environmental justice populations that would be associated with the No Action and Proposed Action Alternatives. Components of environmental justice that are presented include the proportions of the local population that are minority and low-income and the potential for disproportionate effects on these populations.

3.13.1 Affected Environment

Executive Order (E.O.) 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations was issued in 1994 with the purpose of focusing federal attention on the environmental and human health effects of federal actions on minority and low-income populations. The E.O.'s goal is to achieve environmental protection for all communities. Per the E.O., federal agencies are directed to identify and address minority and low-income populations that are disproportionately affected by adverse human health and environmental effects to the greatest extent practicable and permitted by law (USEPA, 2020c). While not subject to this E.O., TVA routinely considers environmental justice in its NEPA review process.

Minority individuals are those who are members of the following demographics: American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic origin), or Hispanic. CEQ defines a "minority population" as a readily identifiable group of people residing in geographic proximity with a population comprised of 50 percent minority or greater or an identifiable group that has a meaningfully greater minority population than the adjacent geographic areas or may also be a geographically dispersed set of individuals such as Native Americans or migrant workers (Spies, Stine, Gravenmier, Long, & Reilly, 2018). In 2018, the minority population in Lowndes County was approximately 48.2%. By comparison, the minority population in the state of Mississippi was approximately 43.0% (USCB 2020a). Based on the USEPA's Environmental

Justice Screening and Mapping Tool (EJSCREEN), 36 percent of the population block (ID# 280870010001) that the Project is located in is considered minority population (USEPA 2020a).

A low-income population is considered a community or group of individuals that live in geographic proximity to one another, or a set of individuals such as American Indians or migrant workers who meet the standards for low income and experience common conditions of environmental exposure or effect. Low-income populations located in an affected area should be identified using the annual statistical poverty thresholds provided by the USCB's annual current population reports (Series P-60) on poverty and income. Poverty is defined as the number of individuals or families with income below a defined threshold level (typically 50 percent) (Spies et al., 2018). Lowndes County's estimated poverty rate for 2018 was 23.1%. By comparison, the state of Mississippi had a poverty rate of approximately 19.7%. (USCB 2020a). Based on the USEPA's EJSCREEN tool, 25 percent of the population block (ID# 280870010001) that the Project is located in is considered low-income population (USEPA 2020).

3.13.2 Environmental Consequences

This section describes the potential impacts on environmental justice populations should the Proposed Action or No Action Alternative be implemented. According to the CEQ, adverse health effects to be evaluated within the context of environmental justice impacts may include bodily impairment, infirmity, illness, or death. Environmental effects may include ecological, cultural, human health, economic, or social impacts. Disproportionately high and adverse human health or environmental effects occur when the risk or rate of exposure to an environmental hazard or an impact or risk of an impact on the natural or physical environment for a minority or low-income population is high and appreciably exceeds the impact level for the general population or for another appropriate comparison group (CEQ 1997).

3.13.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes attributable to the proposed solar Project within Lowndes County that would create disproportionately high and adverse direct or indirect impacts on minority or low-income populations.

3.13.2.2 Proposed Action

Based on the USEPA's online screening tool, EJSCREEN, no minority or low-income populations have been identified in the potentially affected area. Additionally, based on the analysis of impacts for all resource areas presented in this EA, it was determined that there would be no significant adverse health impacts on members of the public or significant adverse environmental impacts on the physical environment (water, air, aquatic, and terrestrial resources) and socioeconomic conditions. As there are no identified environmental justice communities in the block group within which the proposed Project is located, there would be no disproportionately high or any adverse direct or indirect impacts on minority or low-income populations due to human health or environmental effects resulting from the Proposed Action.

3.14 Transportation

This section describes roadways and other transportation infrastructure serving the Project Site and surrounding area, and the potential impacts on transportation resources that would be associated with the No Action and Proposed Action Alternatives. Components of transportation resources that are analyzed include roads, traffic, railroads, and airports.

3.14.1 Affected Environment

The area considered for transportation is located within the Northwest portion of Lowndes County, Mississippi, with the cities of Artesia and Mayhew to the north. Artesia West Point Road runs north-south along the west portion of the north site from Artesia to Mayhew. It appears to be a paved road that turns into a gravel road before it reaches the western boundary of the site. State Highway 182 is a paved road that runs east-west approximately five miles north of the Project Site. Artesia Road is a paved road that runs east-west approximately 1.5 miles north of GT2. Wilmer Gilburn Road is a county-maintained gravel road that runs east to west along the norther boundary of GT2.

Existing traffic volumes on roads in the Project Site were determined using the most recent 2018 Average Annual Daily Traffic (AADT) counts measured at existing Mississippi Department of Transportation (MDOT) stations (MDOT 2019). The 2019 AADT count for Site ID 44110, located on Artesia Road, 1.5 miles north of the Project Site, consisted of 950 vehicles. The 2018 AADT count for Site ID 44003, located on Highway 82 consisted of 20,000 vehicles. There were no AADT counts for Wilmer Gilburn Road.

The closest rail line is operated by Kansas City Southern and runs north to south approximately 1,200 feet west of GT2. The closest regional airport is the GTR Airport, located approximately 3 miles northeast of the Project Site. The airport consists of one runway that is approximately 7,860 feet long.

3.14.2 Environmental Consequences

This section describes the potential impacts to transportation resources should the No Action or Proposed Action Alternatives be implemented.

3.14.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar Project would not be constructed. Therefore, no Project-related impacts to transportation resources would result. Existing land use would be expected to remain as a mix of farmland and undeveloped land, and the existing transportation network and traffic conditions would be expected to remain as they are at present.

3.14.2.2 Proposed Action

The construction and operation of the Project would have no effect on operation of the airports in the region. The operation of the Project would not affect commercial air passenger traffic or freight traffic in the region and would not adversely affect any aerial crop dusters operating in the vicinity of the Project Site.

During construction of the proposed Solar Facility, a crew of approximately 200 to 300 workers would be present at the Project Site between sunrise and sunset, seven days a week. A majority of these workers would likely come from the local area or region. Other workers would come from outside the region, and many would likely stay at hotels in Starkville or Columbus. It is anticipated that workers would drive personal vehicles to the Project Site. Some of the individual workers and work teams would likely visit local restaurants and other businesses during the construction phase of the Project. Additional traffic due to deliveries and waste removal would consist of approximately five vehicles per day during construction, as discussed in more detail below.

Traffic flow around the Project Site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. Deliveries and most workers would likely access the Project Site from the east along Gilmer Wilburn Road and west along Artesia Road. Should substantial traffic congestion occur, MS Solar 6 would implement staggered work shifts during daylight hours to assist traffic flow near Project Site access locations. Implementation of such mitigation measures would minimize potential adverse impacts to traffic and transportation to negligible levels.

Construction equipment and material delivery and waste removal would require approximately 20 flatbed semi-trailer trucks or other large vehicles visiting the Project Site each day during the 17-month construction period. The Project Site can be accessed via routes that do not have load restrictions. These vehicles should be easily accommodated by existing roadways; therefore, only minor impacts to transportation resources in the area surrounding the Project would be anticipated as a result of construction vehicle activity.

Several on-site access roads would be maintained within the Project Site. Access points during construction include several existing farm roads on the south side of Gilmer Wilburn Road,

The Solar Facility would be staffed by up to two full-time workers who would live in the area. The addition of vehicles for full-time staff on local roadways would be accommodated by existing infrastructure; therefore, the operation of the Project would not have a noticeable impact on the local roadways.

The overall direct impacts on transportation resources associated with implementation of the Proposed Action would be moderate during construction due to the influx of workers traveling to the job site. These impacts would be temporary and minimized through appropriate mitigation. The Proposed Action would not result in any indirect impacts on transportation.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND CUMULATIVE IMPACTS

This chapter summarizes the anticipated adverse environmental impacts of the Project and considers the relationship between short-term uses and long-term productivity and whether the Project makes irreversible and irretrievable commitments of resources. This chapter also considers the cumulative impacts in relation to other ongoing or reasonably foreseeable proposed activities within the Project Site and the surrounding area.

4.1 Unavoidable Adverse Environmental Impacts

As described in Section 2 (Table 2-1), the Proposed Action could result in some unavoidable adverse environmental effects. Specifically, construction activities would temporarily increase noise, traffic, and health and safety risks and temporarily affect air quality, GHG emissions, and visual aesthetics of the Project Site vicinity. Construction activities would primarily be limited to daytime hours, which would minimize noise impacts. Temporary increases in traffic would be minimized or mitigated by staggering work shifts and/or posting a flag person during the heavy commute periods. Temporary increases in health and safety risks would be minimized by implementation of the Project health and safety plan. Construction and operations of the Project would have minor, localized effects on soil erosion and sedimentation that would be minimized by placement of construction BMPs, early soil stabilization, and vegetation management measures. Selective maintenance of tree buffers and/or fence screening (existing vegetated fence rows) along the perimeter of the Solar Facility would minimize effects to visual resources, during both construction and operation. The Project would change land uses on the Project Site from primarily agricultural to solar uses, where these practices are not presently occurring.

Table 4-1 provides a list of impacts and proposed mitigation on environmental and human resources associated with the Project.

Table 4-1: Unavoidable Impacts and Proposed Mitigation for the Golden Triangle II Solar Project

Impact Type	Location	Description	Mitigation Measure
Floodplain	Solar Facility	Temporary construction activities within floodplain. Permanent placement of solar arrays and buried collection lines within floodplain.	When rain events greater than ½ inch are predicted, remove large construction equipment from the floodplain during overnight parking, temporary stabilization measures where exposed soils are located, and maintaining any soil stockpiles outside the boundaries of the floodplain. Once in operation, the support structures would not impede floodplains or floodwaters. At its lowest angle, all panels within the floodplain would be greater than 1 foot above BFE.

Impact Type	Location	Description	Mitigation Measure
Streams	Throughout Project Site	Access roads will be used to cross streams.	Utilize existing bridges and culverts first. Where additional stream crossings are needed, keep crossings as narrow as possible and maintain BMPs to keep sediment out of streams.
Wetlands	Throughout Project Site	PEM, PFO and PSS wetlands occur within the Project Site	Avoid jurisdictional wetland and install silt fencing along the outside of the construction work area where wetlands are present.
Soils	Solar Facility areas occurring on agricultural land.	Permanent loss of prime farmland soils.	If fill or soil removal were needed, the topsoil would first be stripped and segregated. Once fill or other intense earthwork was complete, the topsoil would be reapplied to the surface.
Vegetation	Solar Facility	Removal of agricultural and forested vegetation resulting in a large area of exposed soil.	Seeding Solar Facility with native and non-invasive low-growing grasses and flowers that would attract pollinators.
Vegetation	Solar Facility	Prevent unintentional encroachment in avoidance areas.	Install signage and/or temporary construction fencing around avoidance areas. Identify avoidance areas on site plans and constraints maps.
Wildlife	Solar Facility	Temporary displacement of wildlife during construction. Potential direct impacts due to vegetation removal and grading/construction.	Enhance the existing Project Site by revegetating with native and/or naturalized non-invasive herbaceous plants maintained without the extensive use of harmful herbicides and pesticides.
Visual	Solar Facility in vicinity of single-family homes	Three homes within viewshed of Project Site	Avoid clearing mature trees that serve as natural buffers near homes.
Noise	Solar Facility located less than 500 feet from one single-family home	Potential for increased noise levels to residents within 500 feet of inverters.	For the one single-family home that is within 500 feet of an inverter, a pre-construction sound study including an ambient survey would be conducted to quantify the existing ambient environment. After the project reaches commercial operation, MS Solar 6 would measure the sound levels at the property line and identify any equipment that generates a Ldn sound level that exceeds 55 dBA at the property line. If there are locations where noise levels exceed that threshold, MS Solar 6 would install sound buffers (walls, fences with screening, or vegetation) in order to minimize the noise levels from operating equipment

Impact Type	Location	Description	Mitigation Measure
Transportation	Solar Facility	Delivery trucks and most workers would likely access the Project Site from Gilmer Wilburn Road. Potential for congestion, especially if trains are progressing northbound along the adjacent railroad track.	Should substantial traffic congestion occur, MS Solar 6, or its contractor, would implement staggered work shifts to assist traffic flow near Project Site access locations. Implementation of such mitigation measures would minimize potential adverse impacts to traffic and transportation to negligible levels.

With the installation and routine maintenance of appropriate BMPs, no unavoidable adverse effects to groundwater are expected. Long-term habitat loss would occur due to alteration of land use on the Project Site. Revegetation of the Project Site with native and/or noninvasive grasses and herbaceous vegetation would help minimize effects to open, grassy habitats. The Project is not expected to adversely affect any federal or state-listed species.

4.2 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses are generally those that occur on a year-to-year basis, such as wildlife foraging, timber management, recreation, and uses of water resources. Long-term productivity is the capability of the land to provide resources, both market and nonmarket, for future generations. For this EA, long-term impacts to site productivity would be those that last beyond the life of the Project. The Proposed Action would affect short-term uses of the Project Site by converting it from agricultural and undeveloped land to solar power generation. However, the effects on long-term productivity would be minimal because the existing land uses could be readily restored on the Project Site following the decommissioning and removal of the Solar Facility.

4.3 Irreversible and Irretrievable Commitments of Resources

An irreversible or irretrievable commitment of resources would occur if resources would be consumed, committed, or lost as a result of the Project. The commitment of a resource would be considered irretrievable if the Project would directly eliminate the resource, its productivity, or its utility for the life of the Project and possibly beyond. Construction and operation activities would result in an irretrievable and irreversible commitment of natural and physical resources. The implementation of the Proposed Action would involve irreversible commitment of fuel and resource labor required for the construction, maintenance, and operation of the Solar Facility. Because removal of the solar arrays and associated on-site infrastructure could be accomplished rather easily, and the facility would not irreversibly alter the site, the Project Site could be returned to its original condition or used for other productive purposes once the Solar Facility is decommissioned. Most of the Solar Facility components could also be recycled after the facility is decommissioned.

4.4 Cumulative Impacts

A cumulative impact, as defined by the Council on Environmental Quality (CEQ), is described as an impact on the environment that results from the incremental impact of the action when added

to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but aggregately significant actions taking place over a period of time (40 CFR 1508.7). A cumulative impacts analysis acknowledges the effects of the proposed alternatives on the various environmental resources. The analysis also recognizes the effects of other past, present, and reasonably foreseeable future actions, and describes the cumulative or additive effects that may result. While some cumulative effects, however minimal, can be established for virtually any resource or condition, the effects described in this EA are considered to be the most applicable and representative of those associated with the Proposed Action. Cumulative impacts associated with the Proposed Action are described below in the following resource sections. This section addresses the cumulative impacts of the Project when combined with any reasonably foreseeable future action in the vicinity and are depicted in Figure 4-1.

Desktop research of potential past, present, and future actions in the Lowndes County, Mississippi area was conducted. Resources examined included:

- Local and regional news sources.
- City of Starkville and City of Columbus website records, including planning commission meetings, city meeting minutes, and public notices; and
- Mississippi DOT website.

The proposed Project would result in minor direct impacts to land use, geological resources and farmlands, water resources, biological resources, visual resources, noise, air quality, public health and safety, and transportation.

4.4.1 Federal Projects

This section addresses other projects with potential effects to land use, geological resources and farmlands, water resources, biological resources, visual resources, noise, air quality, public health and safety, and transportation.

Based on a review of the above listed resources, and through discussions with local officials, seven projects were identified in Lowndes County that have or will have at least partial federal funding. These seven projects are part of the MSDOT's 5-Year Plan and will receive federal funding and additional funding from either the State or County (MDOT 2021). The projects include sign replacements, 3 rumble strip installation projects along existing highways, and three resurfacing projects along existing highways. The closest of these, a resurfacing project, is directly north of the Project Site on US Hwy 82. The resurfacing along Hwy 82 will occur along the existing roadway about one year before the Golden Triangle Project would begin construction. Given the nature of the impacts of the proposed Golden Triangle Project, the Proposed Action is unlikely to contribute towards adverse cumulative effects to the same resources affected by these MSDOT projects.

The Infinity Megasite is a pending 1,144-acre industrial development that is adjacent to the proposed Golden Triangle Solar Project to the east, on the north side of Artesia Road. The proposed Megasite is a TVA and Golden Triangle Development LINK (LINK) project. A megasite is a land development that is intended to promote business clusters. The organizations (in this case TVA and LINK) develop the land through permitting and infrastructure, so that it is "shovel ready" for big business. The development would result in the permanent conversion of approximately 250 acres of forested land and 894 acres of predominantly agricultural land to commercial/industrial land use. There would be minor impacts on smaller streams and riparian wetlands which would be mitigated through the purchase of wetland and stream mitigation credits or some other approved mitigation development process. The Golden Triangle Solar Project combined with the Infinity Megasite Project would result in an adverse cumulative impact on agricultural land. However, as previously discussed in section 3 of this EA, once the Project is decommissioned, the Project Site could be returned to its pre-construction/pre-operation use without significant effort. Therefore, the Project's contribution towards a long-term cumulative impact on agricultural land, when combined with impacts from the Infinity Megasite, would be minor. If the Golden Triangle Project and the Megasite were constructed at the same time, a minor adverse cumulative impact on air (from construction equipment emissions and fugitive dusts) and noise (from construction equipment operation) would be expected. This would be a short-term cumulative impact that would be most obvious during normal daytime working hours, and it would subside once construction was complete.

Golden Triangle I Solar and BESS Project (GT1) is a recently approved solar project that would be located north of GT2 (on the north side of Gilmer Wilburn Road. The GT1 Project Site is over 3,000 acres and would be expected to generate up to 200 MW of AC capacity with an additional 50 MW of battery storage capacity. Similar to GT2, GT1 will consist of multiple parallel rows of photovoltaic (PV) panels on single-axis tracking structures, along with DC and AC inverters and transformers. MS Solar 5 has entered into long-term lease agreements or land purchases on 29 parcels. Implementation of GT1 will result in the long-term conversion of up to 150 acres of forest and an additional temporary conversion of up 3,444 acres of pasture/agriculture to commercial/industrial use. The table below shows the total potential cumulative impacts from the three projects discussed above. Long-term impacts, such as the clearing of mature trees or the conversion of agricultural land to developed industrial land will inevitably overlap for all three projects, thus resulting in a long-term cumulative impact on those resources. Short-term cumulative impacts would occur on noise and local air quality only if two or more of the projects are under construction at the same time.

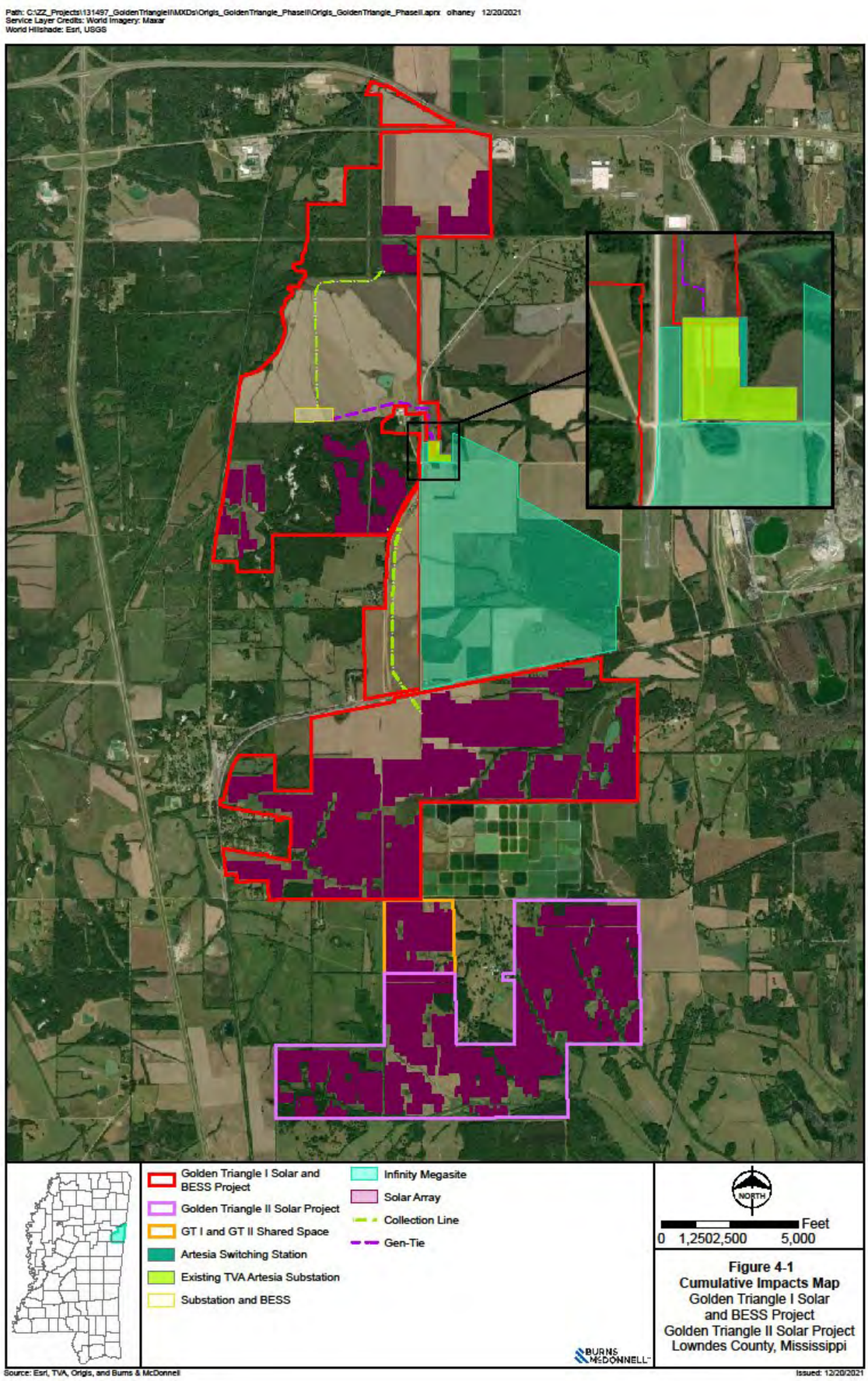


Figure 4-1. Cumulative Impact Map

Table 4-2: Potential Cumulative Impacts Associated with the Golden Triangle II Solar Project

Impact Type	Project	Impact	Description
Forested Uplands	Golden Triangle I Solar and BESS Project	150 acres	Long-term minor cumulative impacts on mature forested areas would occur if two or more of these projects occur within the similar timelines.
	Infinity Megasite Development	250 acres	
	Golden Triangle 2 Solar Project	265 acres	
	Cumulative Total	**665 acres**	
Agricultural Land	Golden Triangle I Solar and BESS Project	3,444 acres	Long-term minor cumulative impacts on agricultural operations would occur if two or more of these projects occur within the similar timelines.
	Infinity Megasite Development	894 acres	
	Golden Triangle 2 Solar Project	1,260 acres	
	Cumulative Total	**5,598 acres**	
Noise	Golden Triangle I Solar and BESS Project	Construction only	Short-term cumulative impacts from construction equipment noise could occur if two or more of the projects have overlapping construction schedules.
	Infinity Megasite Development	Construction only	
	Golden Triangle 2 Solar Project	Construction only	
	Cumulative Total	N/A	
Air Quality	Golden Triangle I Solar and BESS Project	Construction only	Short-term cumulative impacts from construction emissions and dust could occur if two or more of the projects have overlapping construction schedules.
	Infinity Megasite Development	Construction only	
	Golden Triangle2 Solar Project	Construction only	
	Cumulative Total	N/A	

If GT2 and one or more of the other projects were constructed at the same time, a short-term and minor adverse cumulative impact on air (from construction equipment emissions and fugitive dusts) and noise (from construction equipment operation) would be expected. Utilizing water trucks to spray exposed soil during construction would aid in reducing fugitive dusts. Maintaining all construction equipment in good working order would help in minimizing equipment emissions during construction. Even if all three projects were constructed at the same time, fugitive dust mitigation and maintenance of construction equipment and machines are standard best practices that would be expected regardless of whether there is an overlap in the construction schedules for these projects.

There is a possibility that if more than one project were constructed at the same time, nearby residents could experience a minor cumulative impact from construction noise. This would also be a short-term cumulative impact that would be most obvious during normal daytime working hours, and it would subside once construction was complete.

Although not quantified in the table, a cumulative increase in local and regional traffic could be experienced if the proposed Project and one or more of the other projects were to schedule its

peak construction workforce at the same time. Similar to noise impacts, this would also be a short-term cumulative impact that would be most obvious during normal daytime working hours, and it would subside once construction was complete.

Long-term minor temporary cumulative impacts on agricultural operations and mature forests would occur when the Project and one or both of the other projects are operational during the same time period. GT1 and GT2 will certainly be operational at the same time, thus prohibiting agricultural operations within those project sites for at least 20 years. However, under the terms of the conditional PPA between TVA and MS Solar 5, LLC (GT1) and MS Solar 6, LLC (for GT2), TVA would purchase the electric output and environmental attributes generated by the proposed solar facility for an initial term of 20 years, subject to satisfactory completion of all applicable environmental reviews. As mentioned above, once the Project Sites are decommissioned, both Project Sites could be returned to their pre-construction/pre-operation use without significant effort. Therefore, the Project's contribution towards a long-term cumulative impact on agricultural/pastureland and loss of forested habitat, when combined with impacts from the GT1, would be minor.

4.4.2 State and Local Projects

The Project Site is within both the Town of Artesia and unincorporated Lowndes County but is largely rural and agricultural. Aside from the previously discussed County and State projects with associated federal funding, there are no known past, present, or reasonably foreseeable future projects near the proposed Project Site that, when combined with impacts from the Proposed Action, would result in adverse cumulative impact on the same resources.

5.0 LIST OF PREPARERS

Table 5-1 presents the members of the Project team and summarizes the expertise of each member and their contributions to this EA.

Table 5-1: Golden Triangle II Solar Project Environmental Assessment Team

Name/Education	Experience	Project Role
TVA		
J. Taylor Johnson M.S. Environmental Science, B.S. Biochemistry	7 years in environmental planning and policy and NEPA compliance.	NEPA Compliance and Project Management
Adam Dattilo M.S. Forestry B.S. Natural Resource Conservation	17 years in ecological restoration and plant ecology, 10 years in botany	Vegetation
Elizabeth B. Hamrick M.S. Wildlife and Fisheries Science, B.A. Biology	19 years conducting field biology, 13 years technical writing, 10 years NEPA and ESA compliance	Terrestrial Ecology, Threatened and Endangered Species
A. Chevales Williams B.S., Environmental Engineering	15 years of experience in water quality monitoring and compliance; 14 years of NEPA planning and environmental services	Surface Water
Craig Phillips B.S. and M.S. Wildland and Fisheries Science	13 years sampling and hydrologic determination for streams and wet weather conveyances, 12 years in environmental reviews	Aquatics
Carrie Williamson, P.E., CFM M.S., Civil Engineering; B.S., Civil Engineering	7 years Floodplains, 4 years River Forecasting, 3 years NEPA Specialist, 8 years compliance monitoring.	Floodplains
Michaelyn Harle Ph.D., Anthropology; M.A. Anthropology; B.A. Anthropology	20 years in cultural resource management	Cultural and Historic Resources, Section 106 Compliance
Burns & McDonnell		
Jesse Brown B.A. Biology M.S. Biology	12 years in NEPA documentation, environmental permitting, protected species evaluations, and wetland delineations.	Document Preparation, Field Survey Coordination, Field Survey Biologist, Habitat Assessment, Deputy PM
John Fulmer B.A. Anthropology M.A. Anthropology	More than 20 years of experience surveying, documenting, and report writing for cultural and archeological resources	Senior Technical Reviewer

Name/Education	Experience	Project Role
Olivia Haney B.S. Chemistry Certificate: Natural Resources and Environmental Studies	3 years of environmental permitting, wetland and waterbody surveys, and GIS support	Mapping and impact calculations
Ellen Pennington B.S. Ecological Restoration B.S. Renewable Natural Res.	4 years of environmental permitting and NEPA documentation.	Document Preparation
Claire Randall M.S. Biology	4 years of environmental permitting and NEPA documentation.	Document Preparation
Doug Shaver M.S. Environmental & Urban Geosciences Registered Professional Archeologist	13 years in cultural, archeological, and Native American Studies. Graduate Certification in Native American Studies. Graduate Certification in Historic Preservation	Principal Investigator and lead author for cultural resources.
Robyn Susemihl B.S. Zoology, Chemistry minor	17 years in NEPA documentation, project management, protected species analysis, and stream and wetland delineations	Project Manager, Document Preparation, Sr. Technical Review
David Thomas B.S. Biology M.S. Zoology	25+ years preparing NEPA documents, protected species evaluations and surveys, and field assessments	Senior Technical Review
Rebecca Torres B.S. Animal Biology M.S. Wildlife & Fisheries Science	4 years of environmental permitting and NEPA documentation with focus on aquatic ecology	Document Preparation

6.0 LITERATURE CITED

Bullock, Lindsay K. 2008. Mammals of Mississippi 12:1-6. *Eastern Spotted Skunk.* Published December 5, 2008 by the Department of Wildlife and Fisheries, Mississippi State University.

Burns and McDonnell. 2021a. Golden Triangle II Solar Project: Protected Species Habitat Assessment Report. April 2021.

Burns and McDonnell. 2021b. Golden Triangle II Solar Project: Wetland Delineation Report. May.

Chafin, Linda G. 2007. Field Guide to Rare Plants of Georgia. State Botanical Garden of Georgia, Athens, Georgia.

City-Data.2021. City Data for Artesia, MS. http://www.city-data.com/city/Artesia-Mississippi.html. Accessed: December 13, 2021.

Cornell University 2019a. The Cornell Lab. All About Birds. Painted Bunting Life History. https://www.allaboutbirds.org/guide/Painted_Bunting/lifehistory. Accessed December 13, 2021.

Cornell University 2019b. The Cornell Lab. All About Birds. Scissor-tail Flycatcher Life History. https://www.allaboutbirds.org/guide/Scissor-tailed_Flycatcher/lifehistory. Accessed December 13, 2021.

Cornell University 2019c. The Cornell Lab. All About Birds. American Kestrel Life History. https://www.allaboutbirds.org/guide/American_Kestrel/lifehistory. Accessed October 21, 2020.

Cornell University 2019d. The Cornell Lab. All About Birds. Osprey Life History. https://www.allaboutbirds.org/guide/Osprey/lifehistory . Accessed December 13, 2021.

Cornell University. 2019e. The Cornell Lab. All About Birds. Lesser Yellowlegs Life History. https://www.allaboutbirds.org/guide/Lesser_Yellowlegs/lifehistory. Accessed December 213, 2021.

Cornell University. 2019f. The Cornell Lab. All About Birds. Marbled Godwit Life History. https://www.allaboutbirds.org/guide/Lesser_Yellowlegs/lifehistory. Accessed October 20, 2021.

Cornell University 2019g. The Cornell Lab. All About Birds. Red-headed Woodpecker Life History. https://www.allaboutbirds.org/guide/Red-headed_Woodpecker/lifehistory. Accessed October 20, 2020.

Cornell University 2019h. The Cornell Lab. All About Birds. Rusty Blackbird Life History. https://www.allaboutbirds.org/guide/Rusty_Blackbird/lifehistory. Accessed October 20, 2020.

Cornell University 2019i. The Cornell Lab. All About Birds. Short-billed Dowitcher Life History. https://www.allaboutbirds.org/guide/Short-billed_Dowitcher/lifehistory. Accessed October 20, 2020.

Cornell University 2019j. The Cornell Lab. All About Birds. Willet Life History. https://www.allaboutbirds.org/guide/Willet/lifehistory. Accessed October 20, 2020.

Council on Environmental Quality (CEQ). 1997. Environmental Justice Guidance Under the National Environmental Policy Act. Available at: https://ceq.doe.gov/docs/ceq-regulations-and-guidance/regs/ej/justice.pdf. 10 December 1997.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetland and Deepwater Habitats of the United States*. Washington, D.C.: U.S. Fish and Wildlife Publication FWS/OBS-79/31. Accessed 14 September 2020.

Federal Emergency Management Agency (FEMA). 2021a. National Flood Insurance Program. Accessed April 20, 2021. https://www.fema.gov/flood-insurance.

Federal Emergency Management Agency (FEMA). 2021b. National Flood Hazard Layer. Lowndes County, MS. 18 February 2011. Accessed April 20, 2021. https://www.fema.gov/flood-maps/tools-resources/flood-map-products/national-flood-hazard-layer.

Federal Aviation Administration (FAA). 2013. *Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports.* 78 FR 63276

Flora of North America (FNA). 2020. *Carex microdonta*. www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357334. Accessed August 31, 2020.

ForgeSolar. 2020. About Glint & Glare. Website. Accessed in December 2021. Available at: https://www.forgesolar.com/help/#glare.

GEOServices, LLC. R*eport of Geotechnical Exploration for the Proposed Golden Triangle II Solar Project. G*EOServices.

Hilty, John. 2018. Illinois Wildflowers: Prairie Parsely (*Polytaenia nuttallii*). https://www.illinoiswildflowers.info/prairie/plantx/pr_parsley.html. Accessed April 26, 2021.

Hilty, John. 2019a. Illinois Wildflowers: Mead's Sedge (*Carex meadii*). https://www.illinoiswildflowers.info/grasses/plants/mead_sedge.htm. Accessed April 26, 2021.

Hilty, John. 2020a. Illinois Wildflowers: James' Sedge (*Carex jamesii*). https://www.illinoiswildflowers.info/prairie/plantx/wild_hyacinth.htm. Accessed August 31, 2020.

Hilty, John. 2020b. Illinois Wildflowers: Ohio Buckeye (*Aesculus glabra*). https://www.illinoiswildflowers.info/trees/tree_index.htm#oh_buckeye. Accessed April 26, 2021.

Hilty, John. 2020c. Illinois Wildflowers: Wild Hyacinth (*Camassia scilloides*). https://www.illinoiswildflowers.info/prairie/plantx/wild_hyacinth.htm. Accessed August 31, 2020.

Hilty, John. 2020d. Illinois Wildflowers: Kingnut Hickory (*Carya laciniosa*). https://www.illinoiswildflowers.info/trees/plants/kn_hickory.htm. Accessed August 31, 2020.

Hilty, John. 2020e. Illinois Wildflowers: Canada Moonseed (*Menispermum canadense*). https://www.illinoiswildflowers.info/prairie/plants/canada_moonseed.htm. Accessed August 31, 2020.

Hilty, John. 2020f. Illinois Wildflowers: Heath Aster (*Symphyotrichum ericoides*). https://www.illinoiswildflowers.info/prairie/plantx/hth_asterx.htm. Accessed August 31, 2020.

Lowndes County (Lowndes). 2021a. Lowndes County. Tourism. http://lowndescountyms.com/about/tourism/. December 13, 2021.

Lowndes County (Lowndes). 2021b. Lowndes County. Cities, Towns, and Communities. http://lowndescountyms.com/about/cities-towns-and-communities/. December 13, 2021.

MacGown, J.; Brown, R.; and Hill, J. 2006. T*he Black Belt Prairie in Mississippi and Alabama*. Mississippi Entomological Museum. Mississippi State University. Available at: https://mississippientomologicalmuseum.org.msstate.edu/habitats/black.belt.prairie/BlackBeltPrairie.htm.

Minnesota Wildflowers. 2021. A Field Guide to Flora of Minnesota: Great Plains Ladies' tresses (*Spiranthes magnicamporum*). https://www.minnesotawildflowers.info/flower/great-plains-ladies-tresses. Accessed April 27, 2021.

Minnesota Department of Natural Resources. 2021. Species Profile: *Cycleptus elongatus*. https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AFCJC04010. Accessed December 7, 2021.

Minnesota Department of Natural Resources. 2021. Species Profile: *Crystallaria asprella*. https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AFCQC01010. Accessed December 7, 2021.

Mississippi Department of Environmental Quality (MDEQ). 2020. Mississippi Approved 2020 Section 303(d) List of Impaired Water Bodies – Final List Version 2.0. Prepared by MDEQ Surface Water Division of the Office of Pollution Control. Jackson, MS. November 2020.

Mississippi Department of Transportation (MDOT). 2019.Traffic Volume Maps. https://mdot.ms.gov/portal/traffic_volume. Accessed December 13, 2021.

Mississippi Department of Transportation (MDOT). 2020. *Five Year State Strategic Plan for Fiscal Years 2023 - 2027*. Available at: http://www.lbo.ms.gov/misc/strategic/FY23/941-00-plan.pdf. Accessed on December 2, 2021.

Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP). 2022. Black Prairie Wildlife Management Area. Black Prairie WMA Map. https://www.mdwfp.com/media/300636/black-prairie-map.pdf. Accessed February 10, 2022.

Mississippi Hills Natural Heritage Area. 2021. *Who We Are*. Retrieved May 2021 from: https://mississippihills.org/who-we-are/.

Mississippi Natural Heritage Program. 2021. Wildlife of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks. http://www.mdwfp.com/museum/seek-study/natural-heritage-program/. Accessed: May 26, 2021.

Mississippi Natural Heritage Program. 2018. Listed Species of Mississippi. Museum of Natural Science, Mississippi Dept. of Wildlife, Fisheries, and Parks, Jackson, MS. 6 pp. 24 September 2018.

Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, MS. https://www.mdwfp.com/media/256526/endangered_species_of_mississippi.pdf.

Mississippi Natural Heritage Program, 2018b. Special Plants Tracking List. Museum of Natural Science, Mississippi Department of Wildlife, Fisheries, and Parks, Jackson, MS. 12 pp.

Missouri Botanical Garden (MBG). 2020a. Plant Finder: *Fraxinus profunda*. www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=c987. Accessed August 31, 2020.

Missouri Botanical Garden (MBG). 2020b. Plant Finder. *Quercus macrocarpa*. https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a902. Accessed August 31, 2020.

Missouri Department of Conservation (MDC). 2020. Discover Nature: Field Guide. Celestial Lily (*Nemastylis geminiflora*). https://nature.mdc.mo.gov/discover-nature/field-guide/celestial-lily. Accessed August 31, 2020

Missouri Department of Conservation (MDC). 2021. Discover Nature: Field Guide. Eastern Spotted Skunk (*Spilogale putorius*). https://nature.mdc.mo.gov/discover-nature/field-guide/eastern-spotted-skunk. Accessed April 25, 2021.

Montana Natural Heritage Program. 2021. Big-head Evax *Evax Prolifera.* Montanta Field Guide. http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=PDAST3S050. Accessed. April 27, 2021.

National Oceanic and Atmospheric Administration (NOAA). 2019. National Centers for Environmental Information. State Climate Summaries (Revised in 2019). Mississippi. Available via the internet at: https://statesummaries.ncics.org/chapter/ms/. Accessed September 2020.

National Park Service (NPS). 2018. Series: Physiographic Provinces – Coastal Plain Province. https://www.nps.gov/articles/coastalplain.htm. Accessed August 20, 2020.

NatureServeExplorer. 2021a. Cylinder Elimia (*Elimia cylindrica*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.113362/Elimia_cylindracea. Accessed December 7, 2021.

NatureServeExplorer. 2021b. Flat Pigtoe (*Pleurobema marshalli*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.114612/Pleurobema_marshalli. Accessed December 7, 2021.

NatureServeExplorer. 2021c. Freckled Darter (*Percina lenticula*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.116207/Pleurobema_taitianum. Accessed December 7, 2021.

NatureServeExplorer. 2021d. Heavy Pigtoe (*Pleurobema taitianum*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.101698/Percina_lenticula. Accessed December 7, 2021.

NatureServeExplorer. 2021e. Southern Clubshell (*Pleurobema decisum*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.1066298/Pleurobema_decisum. Accessed December 7, 2021.

NatureServeExplorer. 2021f. Southern Combshell (*Epioblasma penita*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.109895/Epioblasma_penita. Accessed December 7, 2021.

NatureServeExplorer. 2021g. Stirrupshell (*Quadrula stapes*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.107836/Theliderma_stapes. Accessed December 7, 2021.

NatureServeExplorer. 2021h. Striped Bass (*Morone saxatilis*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.104731/Morone_saxatilis. Accessed December 7, 2021.

NatureServeExplorer. 2021h. White Heelsplitter (*Lasmigona compressa*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.111988/Lasmigona_compressa. Accessed December 7, 2021.

New York Natural Heritage Program. 2021. Online Conservation Guide for *Carya laciniosa*. Available from: https://guides.nynhp.org/big-shellbark-hickory/. Accessed April 26, 2021.

Paleontology Portal. 2020. Paleontology and Geology of Mississippi. http://paleoportal.org/index.php?globalnav=time_space&sectionnav=state&name=Mississippi. Accessed August 13, 2020.

Phillips, George. 2012. *The Black Prairie of Northeast Mississippi.* Mississippi Outdoors. March – April 2012. Pgs 34 – 35, and 37.

Shaver, Harris, House, and Kepka. 2021. Draft *Phase I Cultural Resources Survey for the Proposed Golden Triangle I Solar Farm Project, Lowndes County, Mississippi.* Prepared for MS Solar 5, LLC, and Tennessee Valley Authority. 17 September 2020. Revised December 2021.

Sibley, David Allen. 2017. Sibley Birds East. A Field Guide to Birds of Eastern North America. Alfred A. Knofp. New York. 2017.

Spies, T. A., Stine, P. A., Gravenmier, R. A., Long, J. W., & Reilly, M. J. (Spies et al.) 2018. Synthesis of science to inform land management within the Northwest Forest Plan area. Gen. Tech. Rep. PNW-GTR-966. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 809-849. Accessed March 6, 2020.

Tennessee Valley Authority (TVA). 1981. *Class Review of Repetitive Actions in 100-Year Floodplain.* Federal Register. Vol. 46, No. 76 (22845 – 22846). 21 April 1981.

Tennessee Valley Authority (TVA). 2014. *Final Programmatic Environmental Assessment*. TVA Solar Photovoltaic Projects. Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia. September 2014. Knoxville, TN.

Tennessee Valley Authority (TVA). 2017a. *Tennessee Valley Authority Site Clearing and Grading Specifications.* Revised July 2017.

Tennessee Valley Authority (TVA). 2017b. *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities, Revision 3.* Edited by G. Behel, S. Benefield, R. Brannon, C. Buttram, G. Dalton, C. Ellis, C. Henley, T. Korth, T. Giles, A. Masters, J. Melton, R. Smith, J. Turk, T. White, and R. Wilson. Chattanooga, TN.

Tennessee Valley Authority (TVA). 2019a. Integrated Resource Plan. Volume I – Final Resource Plan.

Tennessee Valley Authority (TVA). 2019b. Integrated Resource Plan. Volume II – Final Environmental Impact Statement.

Tennessee Valley Authority (TVA). 2021. TVA Heritage Database Results.

Texas Parks and Wildlife. 2021. Plant Guidance by Ecoregions. Ecoregion 4 – The Blackland Prairies. Available at: https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/wildscapes/ecoregions/ecoregion_4.phtml. Accessed May 25, 2021.

United States. 1977. Executive Office of the President Jimmy Carter. Executive Order 11988: Floodplain Management. 24 May 1977.

U.S. Census Bureau (USCB). 2021a. QuickFacts. Lowndes County, Mississippi. https://data.census.gov/cedsci/table?g=0400000US28_0500000US28087&d=ACS%205-Year%20Estimates%20Data%20Profiles. Accessed December 13, 2021.

U.S. Census Bureau (USCB). 2021b. American Community Survey. Obion County, Tennessee. https://data.census.gov/cedsci/table?t=Employment&g=0400000US28_0500000US28087&d=ACS%205-Year%20Estimates%20Data%20Profiles. Accessed December 13, 2021.

U.S. Census Bureau (USCB). 2021c. QuickFacts; Starkville City/Columbus City. Mississippi. https://www.census.gov/quickfacts/fact/table/starkvillecitymississippi,US. Accessed December 14, 2021.

U.S. Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS). ND. State Soil Data Access (SDA) Hydric Soil Ratings by Map Unit. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1389479.html. Accessed December 14, 2021.

U.S. Department of Agriculture. 2018. Official Soil Series Descriptions. https://soilseries.sc.egov.usda.gov/. Accessed. August 30, 2020.

U.S. Department of Agriculture (USDA) 2021 – Natural Resources Conservation Service (NRCS). 2021. Farmland Protection Policy Act. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?cid=nrcs143_008275. Accessed December 14, 2021.

U.S. Environmental Protection Agency (USEPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Office of Noise Abatement and Control. March 1974. 242 pps.

U.S. Environmental Protection Agency (USEPA). 2011. Spill Prevention, Control, and Countermeasures (SPCC) Rule. Streamlined Requirements for Tier I and II Qualified Facilities. May 2011. Available at: http://www.epa.gov/emergencies.

U.S. Environmental Protection Agency (USEPA). 2021b. Mississippi Nonattainment / Maintenance Status for Each County by Year for All Criteria Pollutants. https://www3.epa.gov/airquality/greenbook/anayo_ms.html. Accessed December 13, 2021.

U.S. Environmental Protection Agency (USEPA). 2021c. Laws & Regulations. Summary of Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice. Accessed December 13, 2021.

U.S. Environmental Protection Agency (USEPA). 2021d. 2017 National Emissions Inventory (NEI) Data. https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data. Accessed December 14, 2021.

U.S. Environmental Protection Agency (USEPA). 2020e. Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2018. Accessed August 27, 2020.

U.S. Environmental Protection Agency (USEPA). 2021a. Report on the Environment. Land Use. https://www.epa.gov/report-environment/land-use. Accessed December 13, 2021.

U.S. Environmental Protection Agency (USEPA). 2020a. EPA's Environmental Justice Screening and Mapping Tool. Minority Populations. ID # 280870070001. Available at ejscreen.epa.gov/mapper/.

U.S. Environmental Protection Agency (USEPA). 2020b. EPA's Environmental Justice Screening and Mapping Tool. Low Income Populations. ID # 280870070001. Available at ejscreen.epa.gov/mapper/.

U.S. Fish and Wildlife Service (USFWS). 2015. Midwest Region Endangered Species – Northern Long-eared Bat – *Myotis septentrionalis.* https://www.fws.gov/midwest/Endangered/mammals/nleb/nlebFactSheet.html. Accessed October 21, 2020.

U.S. Fish and Wildlife Service (USFWS). 2016. Price's potato-bean (*Apios priceana*) 5-Year Review: Summary and Evaluation. Updated on 2 September 2016. Available at https://ecos.fws.gov/docs/tess/species_nonpublish/2363.pdf

U.S. Fish and Wildlife Service (USFWS). 2019. Range-wide Indiana Bat Survey Guidelines. April 2019. Available via the internet at: https://www.fws.gov/arkansas-es/docs/FINAL%202019%20Range-wide%20IBat%20Survey%20Guidelines%204.10.19.pdf.

U.S. Fish and Wildlife Service (USFWS). 2019. Midwest Region Endangered Species – Price's Potato Bean (*Apios priceana*). https://www.fws.gov/midwest/endangered/plants/pricesp.html. Accessed October 21, 2020.

U.S. Fish and Wildlife Service (USFWS). 2021. IPaC Report for Golden Triangle Solar Project. Mississippi Ecological Services Field Office. Jackson, MS. April 21, 2020.

U.S. Fish and Wildlife Service (USFWS) 2020b. Wood Stork Mycteria americana – Species Account. North Florida Ecological Services Field Office. https://www.fws.gov/northflorida/Species-Accounts/Wood-stork-2005.htm. Accessed October 21, 2020.

U.S. Forest Service. 2020. Plant of the Week: Indian Paintbrush (*Castilleja coccinea*). https://www.fs.fed.us/wildflowers/plant-of-the-week/Castilleja-coccinea.shtml. Accessed August 31, 2020.

U.S. Forest Service (USFS) 2021. Fire Effects Information System (FEIS): *Quercus macrocarpa*. https://www.fs.fed.us/database/feis/plants/tree/quemac/all.html. Accessed April 26, 2021.

U.S. Geological Survey (USGS). 1998. Ground Water Atlas of the United States, Segment 5 – Arkansas, Louisiana, and Mississippi. https://pubs.usgs.gov/ha/730f/report.pdf. Accessed December 13, 2021.

U.S. Geological Survey (USGS). 2014. Seismic Risk Map. https://earthquake.usgs.gov/static/lfs/nshm/conterminous/2014/2014pga2pct.pdf. Accessed 8/24/2020.

U.S. Geological Survey (USGS). 2018. Water Usage for Mississippi; Lowndes County. https://waterdata.usgs.gov/ms/nwis/water_use?format=html_table&rdb_compression=file&wu_area=County&wu_year=2015&wu_county=087&wu_category=ALL&wu_county_n

ms=Lowndes%2BCounty&wu_category_nms=--ALL%2BCategories--. Accessed December 13, 2021.

U.S. Geological Survey (USGS). 2019a. Volcano Hazards Program. U.S. Volcanoes and Current Activity Alerts. https://volcanoes.usgs.gov/index.html. Accessed September 24, 2021.

U.S. Geological Survey (USGS). 2019b. Earthquakes 101 – The Basics. https://www.usgs.gov/natural-hazards/earthquake-hazards/science/earthquake-hazards-101-basics?qt-science_center_objects=0#qt-science_center_objects. Accessed December 13, 2021.

U.S. Geological Survey (USGS). 2020c. Plants of Louisiana *Agalinis oligophylla*. https://warcapps.usgs.gov/PlantID/Species/Details/1985. Accessed October 21, 2020.

U.S. Global Change Research Program (USGCRP). 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. Rev. 2020. https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf. Accessed August 27, 2020.

U.S. Water Resources Council (USWRC). 1978. Guidelines for Implementing Executive Order 11988, Floodplain Management. FR Vol. 43, No. 29—Friday, February 10, 1978. pp. 6030-6054.

APPENDIX A
TVA'S *SITE CLEARING AND GRADING SPECIFICATIONS*

Tennessee Valley Authority Site Clearing and Grading Specifications

1. General - The project manager with the clearing and/or grading contractor(s) shall review the environmental evaluation documents for the project or proposed activity (categorical exclusion checklist, environmental assessment, or environmental impact statement) along with all clearing and construction appendices, conditions in applicable general and/or site-specific permits, the storm water pollution prevention plan, open burning or demolition notification requirements, and any Tennessee Valley Authority (TVA) commitments to property owners. The contractor shall then plan and carry out operations using techniques consistent with good engineering and storm water management practices as outlined in TVA's best management practices (BMPs) manual. The contractor will protect areas that are to be left unaffected by access or clearing work at and adjacent to all work sites. In sensitive areas and their buffers, the contractor will retain as much native ground cover and other vegetation as possible. BMPs shall be installed before general site clearing or grading, with progressive stabilization BMPs applied from the perimeter toward the interior work areas as grading is completed. Any stabilized area that must be disturbed in subsequent steps shall have temporary BMPs installed until work is completed and the area is restabilized.

   If the contractor fails to use BMPs or to follow environmental expectations discussed in the prebid, prework meeting or present in contract specifications, TVA will order corrective changes and additional work, as deemed necessary in TVA's judgment, to meet the intent of environmental laws and regulations or other guidelines. Major violations or continued minor violations will result in work suspension until correction of the situation is achieved or other remedial action is taken at the contractor's expense. Penalty clauses may be invoked as appropriate.

2. Regulations - The clearing contractor shall comply with all applicable federal, state, and local environmental and antipollution laws, regulations, and ordinances, including without limitation, all air, water, solid and hazardous waste, noise, and nuisance laws, regulations, and ordinances. He or she shall secure, or ensure that TVA has **secured, all necessary permits and authorizations and made all appropriate notifications** to conduct work on the acres shown on the drawings and plan and profile for the contract. The contractor's designated project manager will actively seek to prevent, control, monitor, and safely abate all commonly recognized forms of workplace and environmental pollution. Permits or authorizations and **any necessary certifications of trained employees knowledgeable of environmental requirements shall be documented** with copies submitted to TVA's project manager or environmental specialist before work begins. The **contractor and subcontractors will be responsible for meeting all** conditions **specified in permits.** Permit conditions shall be reviewed in prework discussions.

3. Land and Landscape Preservation - The contractor shall exercise care to preserve the condition of cleared soils by avoiding as much compacting and deep scarring as possible in areas not to be developed for buildings, structures, or foundations. As soon as possible after initial disturbance of the soil and in accordance with any permit(s) or other state or local environmental regulatory requirements, cover material shall be placed to prevent erosion and sedimentation of water bodies or conveyances to

surface water or groundwater. The placement of erosion/sediment controls shall begin at the perimeter and work progressively to the interior of the site. Repeated work in an area will require establishment of a ground cover immediately after each disturbance is completed. In areas outside the clearing, borrow, fill, or use and access areas, the natural vegetation shall be protected from damage. The contractor and his or her employees and subcontractors must not deviate from delineated access routes or use areas and must enter the site(s) at designated areas that will be marked. Clearing operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the remaining natural vegetation and adjacent surroundings in the vicinity of the work. In sensitive public or environmental areas, appropriate buffer zones shall be observed by modifying the methods of clearing or reclearing, grading, borrow, or fill so that the buffer and sensitive area are protected. Some areas may require planting native low-growing plants or grasses to meet the criteria of regulatory agencies, executive orders, or commitments to special program interests.

4. Streamside Management Zones - The clearing and/or grading contractor(s) must leave as many rooted ground cover plants as possible in buffer zones along streams and other bodies of water or wet-weather conveyances thereto. In such streamside management zones (SMZs), tall-growing tree species (trees that would interfere with TVA's National Electrical Safety Code clearances) shall be cut, and the stumps may be treated to prevent resprouting. Low-growing trees identified by TVA as marginal electrical clearance problems may be cut and then the stump treated with growth regulators to allow low, slow-growing canopy development and active root growth. Only approved herbicides shall be used, and herbicide application shall be conducted by certified applicators from the Transmission Operations and Maintenance (TOM) organization after initial clearing and construction. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment, such as a feller-buncher. The method will be selected based on site-specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. Disturbed soils in SMZs must be stabilized by appropriate methods immediately after the access or site is cleared. Stabilization must occur within the time frame specified in applicable storm water permits or regulations. Stumps within SMZs may be cut close to the ground but must not be removed or uprooted. Trees, limbs, and debris shall be prevented from falling into water bodies or immediately removed from streams, ditches, ponds, and wet areas using methods that will minimize dragging or scarring the banks or stream bottom. No debris will be left in the water or watercourse. Equipment will cross streams, ditches, or wet areas only at locations designated by TVA after the application of appropriate erosion-control BMPs and consistent with permit conditions or regulatory requirements.

5. Wetlands - In forested wetlands, tall trees will be cut near the ground, leaving stumps and roots in place. The cambium may be treated with herbicides applied by certified applicators from the TOM organization to prevent regrowth. Understory trees that must be initially cut and removed may be allowed to grow back or may be treated with tree growth regulators selectively to slow growth and increase the reclearing cycle. The decision will be situationally made based on existing ground cover, wetland type, and tree species, since tall tree removal may "release" understory species and allow them to quickly grow to "electrical clearance problem" heights. In many circumstances, herbicides labeled for water and wetland use may be used in reclearing.

At substation, switching stations, and communications sites, wetlands are avoided unless there is no feasible alternative.

6. Sensitive Area Preservation - If prehistoric or historic artifacts or features that might be of archaeological or historical significance are discovered during clearing, grading, borrow, or fill operations, the activity shall immediately cease within a 100-foot radius, and a TVA project manager, an environmental specialist, and the TVA Cultural Resources program manager shall be notified. The site shall be protected and left as found until a determination about the resources, their significance, and site treatment is made by TVA's Cultural Resources Program. Work may continue beyond the finding zone and the 100-foot radius beyond its perimeter.

7. Water Quality Control - The contractor's clearing, grading, borrow and fill, and/or disposal activities shall be performed using BMPs that will prevent erosion and entrance of spillage, contaminants, debris, and other pollutants or objectionable materials into drainageways, surface waters, or groundwater. Special care shall be exercised in refueling equipment to prevent spills. Fueling areas shall be remote from any sinkhole, crevice, stream, or other water body. Open burning debris shall be kept away from streams and ditches and shall be incorporated into the soil. Only materials allowed to be burned under an open burning permit may be incorporated into the soil.

   The clearing and grading contractor(s) and subcontractors will erect and (when TVA or contract construction personnel are unable) maintain BMPs, such as silt fences, on steep slopes and adjacent to any steam, wetland, or other water body. BMPs will be inspected by the TVA field engineer or other designated TVA or contractor personnel routinely and at least as frequently as required by the permit or good management practices and during periods of high runoff; any necessary repairs will be made as soon as practicable. BMP runoff sampling will be conducted in accordance with permit requirements. Records of all inspections and sampling will be maintained on site, and copies of inspection forms and sampling results will be forwarded to the TVA environmental specialist.

8. Turbidity and Blocking of Streams - If temporary clearing, grading, borrow, or fill activities must interrupt natural drainage, appropriate drainage facilities and erosion/sediment controls shall be provided to avoid erosion and siltation of streams and other water bodies or water conveyances. In Tennessee, conditions of an Aquatic Resource Alteration Permit shall be met. Turbidity levels in receiving waters or at storm water discharge points shall be monitored, documented, and reported if required by the applicable permit. Erosion and sediment control measures such as silt fences, water bars, and sediment traps shall be installed as soon as practicable after initial access, site, borrow, fill, or right-of-way disturbance and after sequential disturbance of stabilized areas due to stepwise construction requirement in accordance with applicable permit or regulatory requirements.

   On rights-of-way, mechanized equipment shall not be operated in flowing water except when approved and then only to construct necessary stream crossings under direct guidance of TVA.

   Construction of stream fords or other crossings will only be permitted at approved locations and to current TVA design or construction access road standards. At any construction site, material shall not be deposited in watercourses or within stream bank

areas where it could be washed away by high stream flows. Any clearing debris that enters streams or other water bodies shall be removed immediately. Appropriate U.S. Army Corps of Engineers and state permits shall be obtained for stream or wetland crossings.

9. Air Quality Control - The clearing or grading contractor shall take appropriate actions to limit the amount of air emissions created by clearing and disposal operations to be well within the limits of clearing or burning permits and/or forestry or local fire department requirements. All operations must be conducted in a manner that prevents nuisance conditions or damage to adjacent land, crops, dwellings, highways, or people. If building renovation or demolition is involved, the required air quality organization shall be notified the minimum 10 days in advance, and if the start date is delayed, renotified to start the clock again.

10. Dust and Mud Control - Clearing, grading, borrow, fill, or transport activities shall be conducted in a manner that minimizes the creation of fugitive dust. This may require limitations as to type of equipment, allowable speeds, and routes utilized. Control measures such as water, gravel, etc., or similar measures may be used subject to TVA approval. On new construction sites and easements, the last 100 feet before an access road approaches a county road or highway shall be graveled to prevent transfer of mud onto the public road.

11. Burning - The contractor shall obtain applicable permits and approvals to conduct controlled burning. The contractor will comply with all provisions of the permit, notification or authorization including burning site locations, controlled draft, burning hours, and such other conditions as stipulated. If weather conditions such as wind speed or wind direction change rapidly, the contractor's burning operation may be temporarily stopped by TVA's field engineer. The debris to be burned shall be kept as clean and dry as possible and stacked and burned in a manner that produces the minimum amount of smoke. Residue from burning will be disposed of according to permit stipulations. No fuel starters or enhancements other than kerosene will be allowed.

12. Smoke and Odors - The contractor will properly store and handle combustible and volatile materials that could create objectionable smoke, odor, or fumes. The contractor shall not burn oil or refuse that includes trash, rags, tires, plastics, or other manufactured debris.

13. Vehicle Exhaust Emissions - The contractor shall maintain and operate equipment in a manner that limits vehicle exhaust emissions. Equipment and vehicles will be kept within the manufacturer's recommended limits and tolerances. Excessive exhaust gases will be eliminated, and inefficient operating procedures will be revised or halted until corrective repairs or adjustments are made.

14. Vehicle Servicing - Routine maintenance of vehicles will not be performed on the site, right-of-way, or access route. However, if emergency or “have to” situations arise, minimal/temporary maintenance to vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Some heavy equipment may have to be serviced on the right-of-way, site, or access route, except in designated sensitive areas. The clearing, grading, borrow, or fill contractor will properly maintain these vehicles with approved spill protection controls and countermeasures. If emergency maintenance in a

sensitive or questionable area arises, the Area Environmental Program Administration or project manager will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.

15. Noise Control - The contractor shall take steps to avoid the creation of excessive sound levels for employees, the public, or the site and adjacent property owners. Concentration of individual noisy pieces as well as the hours and locations of operation should be considered.

16. Noise Suppression - All internal combustion engines shall be properly equipped with mufflers. The equipment and mufflers shall be maintained at peak operating efficiency.

17. Sanitation - A designated representative of TVA or the clearing, grading, borrow, fill, or construction contractor shall contract a sanitary contractor who will provide sanitary chemical toilets convenient to all principal points of operation for every working party and at each construction step. The facilities shall comply with applicable federal, state, or local health laws and regulations. They shall not be located closer than 100 feet to any stream or tributary or to any wetland. The facilities shall be required to have proper servicing and maintenance, and the waste disposal contractor shall verify in writing that the waste disposal will be in state-approved facilities. Employees shall be notified of sanitation regulations and shall be required to use the toilet facilities.

18. Refuse Disposal - The clearing, grading, borrow, fill, or construction contractor and subcontractor(s) shall be responsible for daily cleanup and proper labeling, storage, and disposal of all refuse and debris on the site produced by his or her operations and employees. Facilities that meet applicable regulations and guidelines for refuse collection will be required. Only approved transport, storage, and disposal areas shall be used. Records of waste generation shall be maintained for a site and shall be provided to the project manager and environmental specialist assigned to the project.

19. Brush and Timber Disposal (Initial Clearing) - For initial clearing, trees are commonly part of the contractor’s contract to remove as they wish. Trees may be removed from the site for lumber or pulpwood, or they may be chipped or stacked and burned. All such activities must be coordinated with the TVA field engineer and the open burning permits; notifications and regulatory requirements must be met. On rights-of-way, trees may be cut and left in place only in areas specified by TVA and approved by appropriate regulatory agencies. These areas may include sensitive wetlands or SMZs where tree removal would cause excessive ground disturbance or in very rugged terrain where windrowed trees are used as sediment barriers along the edge of the right-of-way, site, or access.

    Trees that have been cut may not be left on a substation, switching station, or communications site.

20. Restoration of Site - All disturbed areas, with the exception of farmland under cultivation and any other areas as may be designated by TVA's specifications, shall be stabilized in the following manner unless the property owner and TVA's engineer specify a different method:

A. The subsoil shall be loosened to a minimum depth of 6 inches if possible and worked to remove unnatural ridges and depressions.

B. If needed, appropriate soil amendments will be added.

C. All disturbed areas will initially be seeded with a temporary ground cover such as winter wheat, rye, or millet, depending on the season. Perennials may also be planted during initial seeding if proper growing conditions exist. Final restoration and final seeding will be performed as line, site, or communications facilities construction is completed. Final seeding will consist of permanent perennial grasses such as those outlined in TVA's *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities (TVA, 2017).* Exceptions would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor with emphasis on using landscaping materials provided in guidelines for low maintenance native vegetation use.

D. TVA holds the option, depending upon the time of year and weather condition, to delay or withdraw the requirement of seeding until more favorable planting conditions are certain. In the meantime, other stabilization techniques must be applied.

E. Vegetation designated by the Federal Invasive Species Council must be eliminated at the work site, and equipment being transported from location to location must be inspected to ensure removal and destruction of live material.

References

Tennessee Valley Authority. 2017. A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities, Revision 3. Edited by G. Behel, S. Benefield, R. Brannon, C. Buttram, G. Dalton, C. Ellis, C. Henley, T. Korth, T. Giles, A. Masters, J. Melton, R. Smith, J.Turk, T. White, R. Wilson. Chattanooga, TN.: Retrieved from <https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects> (n.d.).

Revision July 2017

APPENDIX B
WETLAND AND WATERBODY DELINEATION REPORT

Golden Triangle II Solar Project
Wetland and Waterbody Delineation Report

MS Solar 6, LLC

Golden Triangle Solar Project

Revision 2.0
10/28/2021

Golden Triangle II Solar Project
Wetland and Waterbody Delineation Report

prepared for

MS Solar 6, LLC
Golden Triangle Solar Project
Artesia, MS

Revision 2.0
10/28/2021

prepared by

Burns & McDonnell Engineering Company, Inc.
Atlanta, Georgia

COPYRIGHT © 2021 BURNS & McDONNELL ENGINEERING COMPANY, INC.

EXECUTIVE SUMMARY

MS Solar 6, LLC, is evaluating a site in Lowndes County, Mississippi (MS) for potential development of a 150 megawatt (MW) solar energy facility (Golden Triangle Solar II Project or the Project). Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was contracted by MS Solar 6, LLC, to provide wetland delineation services for the proposed Project, specifically potential parcels upon which solar arrays and other appurtenant facility components may be installed, in Lowndes County, MS (**Figure 1, Appendix A**). The Survey Area consists of approximately 1,525 acres of land that is predominantly used for pasture, hay production, and agriculture with fragmented forested areas throughout. The Project is east of the US Hwy Alt 45, south and adjacent to Gilmer Wilburn Road, North of Swedenburg Road, and west of Hardy Billups Road in Artesia, MS, which is approximately 8 miles east of Starkville, MS and 10 miles west of Columbus, MS. The Project was surveyed for ecological resources from March 8 through March 13, 2021.

The Survey Area is composed of four distinct vegetative/land use communities: active agriculture, bottomland hardwood forest, upland forest, and pasture. A total of 100 aquatic resources were identified within the Survey Area for the Project including 58 ephemeral, intermittent, or perennial streams, 20 ponds, and 22 wetlands. These features, if impacted by the Project, may be subject to regulatory requirements under Section 404 of the Clean Water Act (CWA).

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Page No.

1.0 INTRODUCTION 1-1

2.0 METHODOLOGY 2-1

2.1 Existing Data Review 2-1
2.2 Environmental Field Survey 2-1
2.3 Wetland and Waterbody Classifications 2-2

3.0 RESULTS AND DISCUSSION 3-1

3.1 Existing Data Review 3-1
3.1.1 Online Mapping and Databases 3-1
3.1.2 Climate Information 3-2
3.1.3 Previous Delineations and Jurisdictional Determinations 3-2
3.2 Wetland Delineation Survey 3-2
3.2.1 Vegetation and Land Use Communities 3-3
3.2.2 Waters of the US 3-5
3.3 Conclusions 3-10

4.0 REFERENCES 4-1

APPENDIX A - FIGURES
APPENDIX B - ANTECEDENT PRECIPITATION TOOL ANALYSIS
APPENDIX C - REPRESENTATIVE PHOTOGRAPHS
APPENDIX D - REPRESENTATIVE WETLAND DETERMINATION DATA FORMS
APPENDIX E – TVA RAPID ASSESSMENT METHOD (RAM) FIELD FORM

LIST OF TABLES

Table 3-1: Waterbodies within the Survey Area 3-6
Table 3-2: Wetlands Identified in the Survey Area 3-9

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
1987 Manual	1987 Corps of Engineers Wetlands Delineation Manual
° F	Degrees Fahrenheit
APT	Antecedent Precipitation Tool
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CWA	Clean Water Act
FEMA	Federal Emergency Management Agency
GPS	Global Positioning Systems
HUC	Hydrologic Unit Code
NAIP	National Agriculture Imagery Program
NFHL	National Flood Hazard Layer
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
PAB	Palustrine Aquatic Bed
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
PSS	Palustrine Scrub-shrub Wetland
PUB	Palustrine Unconsolidated Bottom - Pond
Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region – Version 2.0
SSURGO	Soil Survey Geographic
Survey Area	The approximately 1,525 acres that were evaluated during field surveys
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WETS	NRCS's Climate Analysis for Wetlands Table

1.0 INTRODUCTION

MS Solar 6, LLC plans to construct a new utility scale solar farm and associated infrastructure on five parcels in Lowndes County, Mississippi. The Project is east of the US Hwy Alt 45, south and adjacent to Gilmer Wilburn Road, North of Swedenburg Road, and west of Hardy Billups Road in Artesia, MS, which is approximately three miles southeast of Artesia, eight miles east of Starkville, and 10 miles west of Columbus, MS. The Project has the potential to impact wetlands or other water bodies that may be under the jurisdiction of the US Army Corps of Engineers (USACE) as designated by Section 404 of the Clean Water Act (CWA). Burns and McDonnell conducted a wetland delineation for the Project to evaluate the presence of wetlands and other water bodies, including streams, drainages, and ponds. The delineation was conducted within the five parcels being considered for the proposed Project (Survey Area) as identified by MS Solar 6, LLC. The Survey Area included in the wetland delineation totaled approximately 1,525 acres.

2.0 METHODOLOGY

The following discussions summarize the methods used for the review of existing data and the wetland delineation.

2.1 Existing Data Review

Burns & McDonnell reviewed available background information for the proposed Project prior to conducting a site visit. This available background information included:

- U.S. Geological Survey (USGS) 7.5-minute topographic maps (Artesia and Bent Oak, MS quadrangles),
- USGS National Hydrography Dataset (NHD),
- U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) maps,
- National Agriculture Imagery Program (NAIP) aerial photography (2021),
- Federal Emergency Management Agency (FEMA) 2021 National Flood Hazard Layer (NFHL),
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2021 Soil Survey Geographic (SSURGO) digital data for Lowndes County, Mississippi,
- Any wetland delineations performed in adjacent or abutting areas within the last five years, and
- NRCS Climate Analysis for Wetlands Table (WETS Table).

Figure sets 2 and 3 in Appendix A depict this data. A summary of historic and recent rainfall data is provided in Section 3, below.

2.2 Environmental Field Survey

A wetland delineation was completed March 8 - March 13, 2021. The delineation was conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual (1987 Manual) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region – Version 2.0 (Regional Supplement).

Systematic quadrants were used as part of the field delineation methodology in conjunction with desktop analyzed target areas due to characteristics of the Study Area. Wetland data points were established as verification of the known or suspected wetland areas or other Waters of the U.S. (WOTUS) and to confirm the primary non-wetland habitat areas. All wetland points and potential WOTUS were identified on Project mapping using Global Positioning Systems (GPS) with submeter accuracy.

Wetland (and non-wetland) sample points were established using the 1987 Manual and Regional Supplement based on observations of vegetation, topographic and hydrologic features, transitions in the field, and soils. Soil samples were taken using either a soil probe, hand auger, or shovel to a minimum depth of 12 inches. Munsell Color Charts were used to reference soil matrix, mottle and chroma. Observations were documented on the USACE Atlantic and Gulf Coastal Plain Regional Wetland Determination Data Forms from the Regional Supplement (**Appendix D**) as well as through digital photographs representative of each area (**Appendix B**).

2.3 Wetland and Waterbody Classifications

Under typical conditions, wetlands are defined by three key criteria: vegetation, hydrology, and soils. Wetlands in the Survey Area that are anticipated to be jurisdictional are considered part of a palustrine wetland system within either a forested class (PFO), scrub-shrub class (PSS), unconsolidated bottom (PUB), aquatic bed (PAB) and/or an emergent class (PEM).

Palustrine forested wetlands (PFO) consist of an overstory dominated by deciduous broad-leaved tree species such as maples, elms, and oaks, and an assortment of herbaceous plants and vines in the understory. The dominant tree and sapling species found in the Survey Area included water oaks (*Quercus nigra*), green ash (*Fraxinus pennsylvanica*), sugarberry (*Celtis laevigata*), osage orange (*Maclura pomifera*), black willow (Salix nigra), water locust (*Gleditsia aquatica*), red maple (*Acer rubrum*), American sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), Chinese privet (*Ligustrum sinense*), and willow oak (*Quercus phellos*). Common vegetation comprising the understory includes poison ivy (*Toxicodendron radicans*), butterweed (*Packera glabella*), roundleaf greenbrier (*Smilax rotundifolia*), Virginia creeper (*Parthenocissus quinquefolia*), yellow nutsedge (*Cyperus esculentus*), and soft rush (*Juncus effusus*). Primary hydrological indicators observed in PFO wetlands included surface water, saturation in the upper 12 inches, water marks and/or water-stained leaves, drainage patterns, oxidized rhizospheres on living roots, and geomorphic position.

Palustrine scrub-shrub wetlands (PSS). There were two PSS wetlands within the Survey Area. PSS were generally identified within the southern portion of the Survey Area near the lower elevations and relief associated with the floodplain. Typical, dominant scrub shrub species encountered during surveys included green ash, black willow (*Salix nigra*), butterweed, bulbous bittercress (*Cardamine bulbosa*), and soft rush. Primary hydrological indicators observed in PSS wetlands included surface water, saturation in the upper 12 inches, water marks and/or water-stained leaves, and sediment deposits.

Palustrine emergent wetlands (PEM). Species commonly found in the palustrine emergent wetlands within the Survey Area included shallow sedge (*Carex lurida*), black willow, alligator weed (*Alternanthera philoxeroides*), rough cockleburr (*Xanthium strumarium*), butterweed, , annual ragweed (*Ambrosia artemisiifolia*), great ragweed (*Ambrosia trifida*) ,woolgrass (*Scirpus cyperinus*), curly dock (*Rumex crispus*), blackberries (*Rubus* spp.), spike rush (*Eleocharis palustris*), yellow nutsedge, and soft rush. Primary hydrological indicators observed in PEM wetlands include surface water, saturation in the upper 12 inches, algal mats or crust, drainage patterns, geomorphic position, and a positive FAC-neutral test.

Perennial streams are typically characterized by a well-defined channel that contains waterflow all year.

Intermittent streams also have a well-defined channel, with little to no vegetation through the middle; however, these streams may not flow year-round. Under typical conditions, the intermittent streams within the Survey Area likely only contain water flow in the late winter and early spring when ground water levels are higher.

Ephemeral streams exist within open agricultural fields, pastures, and forested areas throughout the Survey Area. These areas have been used for row crops, hay production, and livestock grazing, and over the past century stormwater drainage improvements have been made. Some ephemeral features mapped are manmade drainages, intended to aid in agricultural production, and have altered the historical drainage patterns that would have existed prior to farming in this region.

3.0 RESULTS AND DISCUSSION

The following sections describe the results of the desktop data review and the completed wetland delineation survey.

3.1 Existing Data Review

The initial phase of this study included a comprehensive review and assessment of all available information related to the Survey Area and adjacent properties.

3.1.1 Online Mapping and Databases

The existing USGS topographic maps were reviewed to familiarize Burns & McDonnell wetland personnel with the topography and potential locations of wetlands and other water bodies (**Figure Set 2, Appendix A**). The USGS topographic maps indicate the Survey Area crosses open fields and forested areas with gentle slopes. Elevation within the Survey Area ranges from approximately 217 feet to 357 feet above mean sea level (asl)

A review of FEMA's NFHL indicates the southern portion of the Survey Area is within a 100-year floodplain (Figure Set 2, Appendix A). The floodplain is predominately associated with the north branch of Magowah Creek, which flows along the southern boundary of the Survey Area.

The NWI data identified a variety of wetland types, primarily associated with riparian areas along perennial streams. The NHD data identified perennial and intermittent streams (Figure Set 2, Appendix A). Basing the presence or absence of wetlands on only NWI maps cannot be assumed as an accurate assessment of potentially occurring jurisdictional wetlands. Wetland identification criteria differ between the USFWS and the USACE. As a result, wetlands shown on an NWI map may not be under the jurisdiction of the USACE; likewise, all USACE-jurisdictional wetlands are not always identified on NWI maps. Therefore, a detailed field survey was conducted to identify any wetlands or other water bodies that may be present.

The USDA NRCS SSURGO digital data indicate that portions of more than 12 soil map units are within the Survey Area (**Figure Set 3, Appendix A**). Approximately 605 acres of the mapped soils (or approximately 40 percent of the Survey Area) are on the hydric soil lists (Map Unit Soil Key, Appendix A). The Survey Area is located within MLRA-135A (Alabama and Mississippi Blackland Prairie). Therefore, upland soils will exhibit a low chroma matrix, which is characteristic of the native parent material and is not necessarily the result of extensive soil saturation.

The 2021 NAIP aerial photography indicates the Survey Area consists largely of maintained pastureland, actively cultivated agriculture, and fragmented forested areas. (Figure Set 4, Appendix A).

3.1.2 Climate Information

The Antecedent Precipitation Tool (APT) – developed by the USACE – was used to assess the climate conditions in the months leading up to and during the March 2021 pedestrian survey. The APT provides a standardized method for evaluating precipitation conditions relative to a climate normal, the presence of drought conditions, and the approximate dates of wet and dry seasons for a given location.

At the time of the March 2021 pedestrian survey, conditions on site appeared to be dry, with little to no rainfall immediately before field mobilization. The APT results (**Appendix C**) confirm that conditions on site were normal, and the overall drought index (PDSI) was listed as mild wetness.

Weather conditions during the field surveys varied from clear to overcast and temperatures ranged from a low of 31 degrees Fahrenheit (°F) to a high of 80°F.

3.1.3 Previous Delineations and Jurisdictional Determinations

Burns & McDonnell was provided with a copy of the 2016 Wetland Delineation and Determination Report for the GTRA Mega Site in Lowndes County (Headwaters, Inc., 2016). The Mega Site, which is the future location for an industrial and technology park, was first surveyed in 2009/2010 and is approximately four to five miles north northeast from the Survey Area. Similar results were obtained during the 2015/2016 study. The Mega Site Report provides a more baseline look at a site conditions during a typical year in terms of normal rainfall levels. Additionally, in 2020, a wetland delineation was conducted for a proposed solar facility on approximately 4000 acres immediately north of the Survey Area. Results for that wetland delineation were similar, however, record rainfall for the year, in addition to several heavy rain events, were encountered during that delineation, resulting in wetter than normal conditions in 2020 (Burns & McDonnell 2020).

3.2 Wetland Delineation Survey

From March 8 through March 13, 2021, a team of Burns and McDonnell wetland scientists conducted a wetland delineation over 1,525 acres of land that is being considered for the siting of the new Golden Triangle II Solar Project. The field surveys documented average hydrologic conditions, and evaluated multiple parameters in addition to hydrology, including hydric soils, hydrophytic vegetation, and a variety of stream morphological characteristics in making resource determinations. Sample plots were established at multiple locations, and wetland determination data forms from the Regional Supplement were completed to characterize the Survey Area (**Appendix D**). Vegetation, soil conditions, and hydrologic

indicators were recorded at each of these sample plots. Locations of sample plots and other identified features were surveyed using a sub-meter accurate GPS unit. Natural color photographs depicting water bodies, streams, and representative field conditions were taken and are included in **Appendix B**. Additional representative photographs were taken during the wetland delineation to document onsite conditions where sample plots were not collected. These additional photographs are not included in Appendix B but can be provided upon request. Land cover and delineated wetlands from field surveys are discussed in detail below.

3.2.1 Vegetation and Land Use Communities

The Project is in the US Environmental Protection Agency (USEPA) Blackland Prairie Ecoregion (Level 4) and is in the Middle Tombigbee River [Hydrologic Unit Code (HUC) 03160106] and Tibbee Creek (HUC 03160104) watersheds.

Four distinct vegetative cover/land use communities were observed in the Survey Area, including active agriculture and pasture, bottomland hardwood forest, upland forest, and right-of-way. Descriptions of these communities are provided below. Soils within the Survey Area, as identified in the USDA NRCS geospatial data for Lowndes County, included Brooksville silty clay, Catalpa silty clay, Demopolis-Binnsville complex, Leeper silty clay, Okolona silty clay, Sumter silty clay loam, Sumter-Demopolis-Chalk outcrop complex, and Vaiden silty clay. Catalpa silty clay, Demopolis-Binnsville complex, Leeper silty clay, Sumter silty clay loam, Sumter-Demopolis-Chalk outcrop complex, and Vaiden silty clay are identified by the NRCS as having hydric components. (Figure Set 3, Appendix A).

Active Agriculture and Pasture

Active agricultural and pasture is the primary land use community found in the Survey Area and composed approximately 73.64 percent (1,123 acres) of the Survey Area. Areas identified as active agriculture include cattle pasture, hay production, and row crop fields. Vegetation in these communities is maintained in an early successional state due to crop growth/harvesting, and regular management/mowing. Corn is planted in late spring and cover the row crop fields on approximately 125 acres. Vegetation observed in pastures consists of primarily tall fescue grass (*Festuca arundinacea*), Johnson grass (*Sorghum halepense*), annual bluegrass (*Poa annua*), couch grass (*Elymus repens*), bermuda (*Cynodon dactylon*), annual ragweed, cheatgrass (*Bromus tectorum*), perennial ryegrass (*Lolium perenne*), green foxtail (*Setaria viridis*), butterweed, bulbous bittercress (*Cardamine bulbosa*), soft rush (*Juncus effusus*), Cherokee sedge (*Carex cherokeensis*), fox sedge (*Carex vulpinoidea*), red sorrel (*Rumex acetosella*), curly dock (*Rumex crispus*), prairie fleabane (*Erigeron strigosus*) , jimsonweed (*Datura*

stramonium), Carolina horsenettle (*Solanum carolinense*), bull thistle (*Cirsum vulgare*), wild violet (*Viola sororia*), field garlic (*Allium vineale*), and sensitive partridge pea (*Chamaecrista nictitans*).

The soil matrix color throughout these areas ranged from a 2/1 (black) to a 5/4 (yellowish brown) on the 10YR chart; however, little to no redox concentrations or depletions were present. The Survey Area is located within MLRA-135A (Alabama and Mississippi Blackland Prairie). Therefore, upland soils will exhibit a low chroma matrix, which is characteristic of the native parent material and is not caused by wetness of the soil. Since redox concentrations were not present within at least 4-inches of the first 12-inches (F6) or 6-inches of redox within the first 10-inches of soil samples collected, the soils in the active agricultural fields and pasturelands do not meet the requirements for hydric soil indicators.

Bottomland Hardwood Forest

Approximately 17.6 percent (268 acres) of the Survey Area is composed of forested areas. Bottomland hardwood forest communities in the Survey Area are composed of a canopy age ranging from approximately 20 to 70+ years old. Dominant vegetation observed consisted of water hickory (*Carya aquatica*), willow oak, cherrybark oak (*Quercus pagoda*), swamp chestnut oak (*Quercus michauxii*), silky dogwood (*Cornus amomum*), osage orange, green ash, eastern red cedar (*Juniperus virginiana*), water locust, shagbark hickory (*Carya ovata)*, box elder (*Acer negundo*), red maple, American sycamore (*Platanus occidentalis*), sugarberry, Cherokee sedge (*Carex cherokeensis*), wild petunia (*Ruellia humilis*), tall fescue, poison ivy, greenbrier, Virginia spiderwort (*Tradescantia virginiana*), Virginia creeper, prairie ironweed (*Vernonia fasciculata*), hairy buttercup (*Ranunculus sardous*), and resurrection fern (*Pleopeltis polypodioides*),

Upland Forest

Upland forest communities in the Survey Area and are composed of a canopy age ranging from approximately 20 to 70 years old. Dominant vegetation observed consisted of white oak (*Quercus alba*), southern red oak (*Quercus falcata*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), mockernut hickory (*Carya tomentosa*), shagbark hickory, pignut hickory (*Carya glabra*), loblolly pine (*Pinus taeda*), eastern red cedar, American elm (*Ulmus americana*), honey locust (*Gleditsia triacanthos*), osage orange, Chinese privet, Devil's walkingstick (*Aralia spinosa*), Christmas fern (*Polystichum acrostichoides*), Japanese honeysuckle (*Lonicera japonica*), multiple greenbrier species (*Smilax spp*.), muscadine (*Vitus rotundifolia*.), Virginia creeper, blackberry (*Rubus spp*.), wooly panic grass (*Dichanthelium acuminatum*), and wild violet.

3.2.2 Waters of the US

Jurisdictional water(s) of the US are defined by 33 CFR Part 328.3 (b) and are protected by Section 404 of the CWA (33 USC 1344). An assessment of potential water(s) of the US that were identified within the Survey Area was performed using USGS topographic maps, NWI maps, county soil survey maps, and then refined during field investigations. Wetland locations were determined using the 1987 Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: 2010 Atlantic and Gulf Coastal Plain. The multi-parameter approach requires that areas be considered jurisdictional wetlands if they exhibit evidence of all three wetland classification parameters. During the field surveys, a total of 59 potential ephemeral, intermittent, or perennial streams, 20 open waters, and 19 wetlands were identified within the Survey Area of the Project. Additionally, the USACE Mobile district has not made any official jurisdictional determinations on aquatic resources within the Survey Area for this project at this time (**Table 3-2 and Figure Set 4, Appendix A**).

Streams

Fifty-nine stream channels, consisting of three stream types (perennial, intermittent, and ephemeral) and totaling 50,858 linear feet were delineated within the Survey Area (**Photographs, Appendix C**). The different stream types are summarized below.

Thirty-one ephemeral stream channels, totaling 12,195 feet were delineated in the Survey Area. Ephemeral streams were characterized by a defined bed and bank, with some water but no flow during the survey, indicating that these streams largely carry water only during and after precipitation events. Ephemeral streams ranged from approximately 1 to 2 feet in width at the ordinary high-water mark (OHWM) (if present) and with bank heights ranging from 0.25 to 2 feet. At the time of the delineation, water was not observed flowing in features identified as ephemeral streams. The substrates of the ephemeral streams were comprised of vegetation and silt with limited gravel. These streams were in upland fields and wooded riparian areas.

Twenty-two intermittent stream channels, totaling 13,138 feet were delineated in the Survey Area. Intermittent streams were characterized by the presence of a limited volume of flow at the time of the site visit. This is a likely indicator that the stream is partially influenced by groundwater, but it may not flow during dry periods. Intermittent streams were one to four feet in width at the OHWM with bank heights ranging from one to three feet. At the time of the delineation, water was observed at a depth of 0.25 inches to six inches. The substrates of intermittent streams were comprised of silt with limited gravel. These streams flowed through upland fields, agricultural fields, and wooded riparian areas.

Six perennial streams, totaling 25,525 feet were delineated within the Survey Area. Perennial streams were characterized by the presence of a substantial volume of flow at the time of the site visit as well as secondary characteristics such as observance of fish and rooted aquatic fauna, indicating that water flows year-round. Perennial streams were approximately 6 to 25 feet in width at the OHWM with bank heights ranging from 3 to 25 feet. At the time of the delineation, the depth of water observed was 0.5 to 2.5 feet. The substrates of the perennial streams were likely comprised of silt, gravel, and cobble although this could not be confirmed at all streams due to turbidity. Perennial streams flowed through upland fields, agricultural fields, and wooded riparian areas.

Common riparian vegetation associated with streams in the Survey Area consisted of Osage orange, eastern red cedar, sugarberry, tall fescue, deadnettle henbit, white clover, Japanese honeysuckle, and curly dock.

There are no streams within the Survey Area listed on the final 2018 version of Mississippi's 303(d) list as "non-supporting" streams. Further, there are no streams located within one linear mile upstream of, and within the same watershed as a "non-supporting" biota impaired system.

Table 3-1: Waterbodies within the Survey Area

Waterbody ID	Waterbody Type	Length of Stream (feet) in Survey Area	Latitude (N°)	Longitude (W°)	Anticipated Jurisdictional Status[a]
S-01	Intermittent	1,113	33.398430	-88.615520	Yes
S-02	Intermittent	156	33.398198	-88.616934	Yes
S-03	Intermittent	151	33.398200	-88.617606	Yes
S-04	Ephemeral	776	33.397542	-88.616120	Yes
S-05	Perennial	4,243	33.392894	-88.595945	Yes
S-05	Intermittent	695	33.398762	-88.600374	Yes
S-06	Intermittent	135	33.395984	-88.598576	Yes
S-07	Intermittent	606	33.395746	-88.598127	Yes
S-08	Ephemeral	54	33.393545	-88.596627	Yes
S-09	Intermittent	429	33.391849	-88.594758	Yes
S-10	Ephemeral	36	33.391766	-88.594767	Yes
S-11	Intermittent	523	33.391423	-88.594635	Yes
S-12	Intermittent	284	33.390741	-88.594455	Yes
S-13	Ephemeral	700	33.400203	-88.598452	Yes
S-14	Ephemeral	1,675	33.396808	-88.593018	Yes
S-14	Intermittent	550	33.394039	-88.592681	Yes
S-15	Ephemeral	217	33.397628	-88.607215	Yes

Waterbody ID	Waterbody Type	Length of Stream (feet) in Survey Area	Latitude (N°)	Longitude (W°)	Anticipated Jurisdictional Status[a]
S-16	Perennial	11,766	33.386522	-88.601192	Yes
S-16a	Ephemeral	54	33.383941	-88.605115	Yes
S-17	Ephemeral	582	33.390062	-88.601587	Yes
S-18	Intermittent	303	33.384060	-88.602421	Yes
S-19	Perennial	664	33.386621	-88.608580	Yes
S-20	Ephemeral	122	33.383512	-88.608229	Yes
S-21	Intermittent	378	33.385406	-88.607775	Yes
S-22	Ephemeral	98	33.384430	-88.601223	Yes
S-23	Perennial	2,790	33.382229	-88.611714	Yes
S-24	Ephemeral	74	33.383015	-88.606066	Yes
S-25	Intermittent	267	33.382520	-88.606954	Yes
S-26	Ephemeral	125	33.382196	-88.609409	Yes
S-27	Ephemeral	26	33.382123	-88.610159	Yes
S-28	Intermittent	281	33.383820	-88.610585	Yes
S-29	Intermittent	3,430	33.385584	-88.617176	Yes
S-30	Ephemeral	592	33.388403	-88.616447	Yes
S-30	Intermittent	812	33.386607	-88.616824	Yes
S-31	Perennial	1,225	33.387178	-88.624430	Yes
S-32	Ephemeral	743	33.388455	-88.625646	Yes
S-33	Perennial	4,837	33.382752	-88.625294	Yes
S-34	Ephemeral	403	33.382488	-88.630895	Yes
S-34	Intermittent	569	33.383384	-88.630041	Yes
S-35	Ephemeral	314	33.382634	-88.625302	Yes
S-35	Intermittent	940	33.382848	-88.627052	Yes
S-36	Ephemeral	608	33.383681	-88.626213	Yes
S-37	Ephemeral	89	33.382964	-88.626732	Yes
S-38	Ephemeral	88	33.383651	-88.628071	Yes
S-39	Ephemeral	30	33.384041	-88.629223	Yes
S-40	Ephemeral	294	33.385219	-88.630229	Yes
S-40	Intermittent	881	33.386650	-88.629530	Yes
S-41	Ephemeral	496	33.385017	-88.630584	Yes
S-42	Intermittent	951	33.385432	-88.632391	Yes
S-43	Ephemeral	267	33.385721	-88.632310	Yes
S-44	Intermittent	273	33.384673	-88.632255	Yes
S-45	Ephemeral	1,119	33.385135	-88.634096	Yes
S-46	Ephemeral	438	33.385327	-88.634724	Yes
S-47	Ephemeral	573	33.384824	-88.633379	Yes
S-48	Ephemeral	47	33.384964	-88.634193	Yes

Waterbody ID	Waterbody Type	Length of Stream (feet) in Survey Area	Latitude (N°)	Longitude (W°)	Anticipated Jurisdictional Status[a]
S-49	Ephemeral	148	33.384355	-88.633272	No
S-50	Intermittent	677	33.383387	-88.635013	Yes
S-51	Ephemeral	230	33.383112	-88.634557	Yes
S-52	Ephemeral	249	33.383282	-88.633892	Yes
S-53	Ephemeral	96	33.382538	-88.623974	Yes
S-54	Ephemeral	63	33.384107	-88.630742	Yes
S-55	Ephemeral	54	33.385893	-88.611832	Yes
S-56	Ephemeral	191	33.386057	-88.627318	Yes
S-57	Intermittent	23	33.381979	-88.609655	Yes
S-58	Intermittent	31	33.382007	-88.608449	Yes

(a) An official Jurisdictional Determination can only be provided by the USACE. Anticipated jurisdictional status of the ephemeral streams within the Study Area are based on pre-2015 definition of Waters of the U.S.

Palustrine Unconsolidated Bottom – PUB

Palustrine unconsolidated bottom wetlands accounted for approximately 14.15 acres (less than one percent) of the total Survey Area. Common vegetation associated with the banks and riparian areas of the PUBs consisted of tall fescue, white clover, tall buttercup, little blue stem, annual bluegrass, scutch grass, curly dock, spike rush, Unknown sedge (*Carex sp.*), *Rubus sp.*, osage orange, and black willow.

Palustrine Forested Wetlands - PFO

Palustrine forested wetlands accounted for less than one percent (2.8 acres) of the total Survey Area. The common overstory and understory vegetation consists of sugarberry, Osage orange, green ash, American sycamore, red maple and Chinese privet; and common vines, shrubs, and herbaceous vegetation consists of poison ivy, saw-tooth blackberry, butterweed, alligator weed, Virginia creeper, Virginia wild rye, and soft rush.

Palustrine Emergent Wetlands - PEM

Palustrine emergent wetlands accounted for less than one percent (11.89 acres) of the total Survey Area. Common vegetation observed within the emergent wetlands included black willow, butterweed, shallow sedge, rough cockleburr, woolgrass (*Scirpus cyperinus*), curly dock, yellow nutsedge, blackberries, soft rush, and alligator weed.

Palustrine Scrub/Shrub - PSS

Palustrine scrub/shrub wetlands accounted for less than one percent (2.49 acres) of the total Survey Area. Common vegetation observed within the scrub/shrub wetlands included, green ash, water locust, butterweed, curly dock, and soft rush.

Table 3-2: Wetlands Identified in the Survey Area

Waterbody #	Waterbody Type	Area of Wetland (acre) in Survey Area	Latitude (N°)	Longitude (W°)	Anticipated Jurisdictional Status
W-PUB-01	PUB	0.82	33.390615	-88.622578	No
W-PUB-02	PUB	1.30	33.398449	-88.618331	Yes
W-PUB-03	PUB	0.98	33.400909	-88.621106	Yes
W-PUB-04	PUB	0.54	33.398434	-88.617285	Yes
W-PUB-05	PUB	0.12	33.398039	-88.614666	Yes
W-PUB-06	PUB	2.33	33.392168	-88.617827	Yes
W-PUB-07	PUB	0.64	33.400902	-88.604401	Yes
W-PUB-08	PUB	1.26	33.394151	-88.603418	Yes
W-PUB-09	PUB	1.26	33.396837	-88.597633	Yes
W-PUB-10	PUB	1.70	33.392798	-88.593924	Yes
W-PUB-11	PUB	0.20	33.401778	-88.598020	Yes
W-PUB-12	PUB	1.04	33.384690	-88.620443	Yes
W-PUB-13	PUB	0.52	33.387199	-88.609356	Yes
W-PUB-14	PUB	0.35	33.385786	-88.607932	Yes
W-PUB-15	PUB	0.01	33.385725	-88.626303	Yes
W-PUB-16	PUB	0.02	33.387018	-88.625912	Yes
W-PUB-17	PUB	0.01	33.382151	-88.610252	Yes
W-PUB-18	PUB	0.21	33.388520	-88.626905	Yes
W-PUB-19	PUB	0.74	33.386950	-88.632622	Yes
W-PUB-20	PUB	0.13	33.383228	-88.613899	Yes
W-PAB-01	PAB	0.05	33.392337	-88.594335	Yes
W-PEM-01	PEM	0.04	33.398553	-88.620092	No
W-PEM-02	PEM	0.12	33.396014	-88.598877	Yes
W-PEM-03	PEM	2.69	33.382459	-88.614429	Yes
W-PEM-04	PEM	1.91	33.384396	-88.606745	Yes
W-PEM-05	PEM	0.37	33.389049	-88.616437	Yes
W-PEM-06	PEM	0.13	33.387225	-88.624340	Yes
W-PEM-07	PEM	0.40	33.384263	-88.620243	Yes
W-PEM-08	PEM	5.95	33.385407	-88.617114	Yes
W-PEM-09	PEM	0.09	33.389411	-88.623204	Yes
W-PEM-10	PEM	0.20	33.385923	-88.602325	Yes
W-PSS-01	PSS	0.09	33.382495	-88.613855	Yes
W-PSS-02	PSS	0.02	33.383829	-88.628843	Yes
W-PFO-01	PFO	0.10	33.399329	-88.593939	Yes
W-PFO-02	PFO	0.49	33.393151	-88.593141	Yes
W-PFO-03	PFO	0.10	33.386080	-88.611841	Yes
W-PFO-04	PFO	0.27	33.392033	-88.595561	Yes

Waterbody #	Waterbody Type	Area of Wetland (acre) in Survey Area	Latitude (N°)	Longitude (W°)	Anticipated Jurisdictional Status
W-PFO-05	PFO	0.40	33.382596	-88.620742	Yes
W-PSS/PFO-01	PSS/PFO	3.83	33.383761	-88.603730	Yes

(a) An official Jurisdictional Determination can only be provided by the USACE. The anticipated jurisdictionality of the ephemeral streams within the Study Area are based on the pre-2015 definition of Waters of the U.S.

3.3 Conclusions

Based on the review of past studies, available online databases and mapping, and the detailed field assessment performed on the Survey Area, it is concluded that the Survey Area is generally consistent with the surrounding geography. Topography and land use are similar with adjacent properties and land use activities have been primarily related to agricultural and hay production.

Based upon the field surveys, it was determined that approximately 1,402 acres of the Survey Area are classified as dry land (uplands). There are approximately 25,525 linear feet of perennial streams, 13,138 linear feet of intermittent streams, and 12,295 feet of ephemeral streams. Approximately 14.2 acres are composed of PUB ponds. Table 3-4 shows different habitat types, approximate acreage, and length of each feature present in the Survey Area.

Factors considered in determining jurisdictional waters of the U.S. included criteria as defined under the recent U.S. District Court's relinquishment of the 2020 Navigable Waters Protection Rule and re-instatement of the pre-2015 definition of Waters of the U.S. Conditions observed during the wetland delineation survey determined that 39 wetlands and 59 streams within the Survey Area meet the definition of waters of the U.S. (Tables 1 and 2). The features indicated as "Yes" in Tables 1 and 2 are presumed to be under the jurisdiction of the USACE; however, an official Jurisdictional Determination can only be made by the USACE.

TVA is obligated under Executive Order 11990 to avoid the destruction, loss, or degradation to wetlands to the extent practicable. This obligation applies to all wetland features, including those wetlands that do not fall under USACE jurisdiction. Project siting should demonstrate wetland avoidance and minimization of wetland impacts for all wetland features on site, regardless of USACE jurisdictional status. If permanent impacts to jurisdictional waters of the U.S. cannot be completely avoided, they should be minimized to the extent practicable, and a Section 404 permit from the USACE may be required. Depending on the size, location, and purpose of the permanent or temporary impacts, a variety of Nationwide Permits may be used for access roads, road crossings, and land-based renewable energy generation facilities. Depending on the type and extent of impacts to waters of the U.S., permitting

requirements may range from a self-certifying Nationwide Permit, Nationwide Permit requiring a formal Pre-Construction Notification (PCN) submittal, or an individual permit may be required. Regardless of which Nationwide Permit(s) is applicable to the Project, the regional and general conditions of the Nationwide Permit(s) would apply and would need to be followed during Project construction.

4.0 REFERENCES

Burns & McDonnell. 2020. Golden Triangle Solar Project: Wetland and Waterbody Delineation Report. Prepared for Origis Energy MS Solar 5. June 2020.

Headwaters, Inc., 2016. Wetland Delineation and Determination for the GTRA Mega Site. Prepared for Calvert-Spradling Engineers, Inc. January 2016.

U.S. Army Corps of Engineers. 1987. 1987 Corps of Engineers Wetland Delineation Manual (1987 Manual).

U.S. Army Corps of Engineers. 2010. Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region – Version 2.0 (Regional Supplement).

APPENDIX A - FIGURES

Artesia Rd
Sessums Rd
Artesia
Artesia Rd
Artesia Rd
Airport Rd
Highway 45 South Alternate
Gilmer Creek
Gilmer Creek
Highway 45 S
Catalpa Creek
Red Bud Creek
Oktibbeha
Lowndes
North Branch Magowah Creek
North Branch Magowah Creek
Magowah Creek
South Branch Magowah Creek
S Highway 45 Alternate
Rocky Bottom Creek
Carson Rd
Robinson Rd
Moor High Rd
Cedar Creek
45
788
789

Arkansas
Georgia
Project Location
Mississippi
Alabama
Birmingham

Survey Corridor

NORTH
1 0.5 0 1
Miles

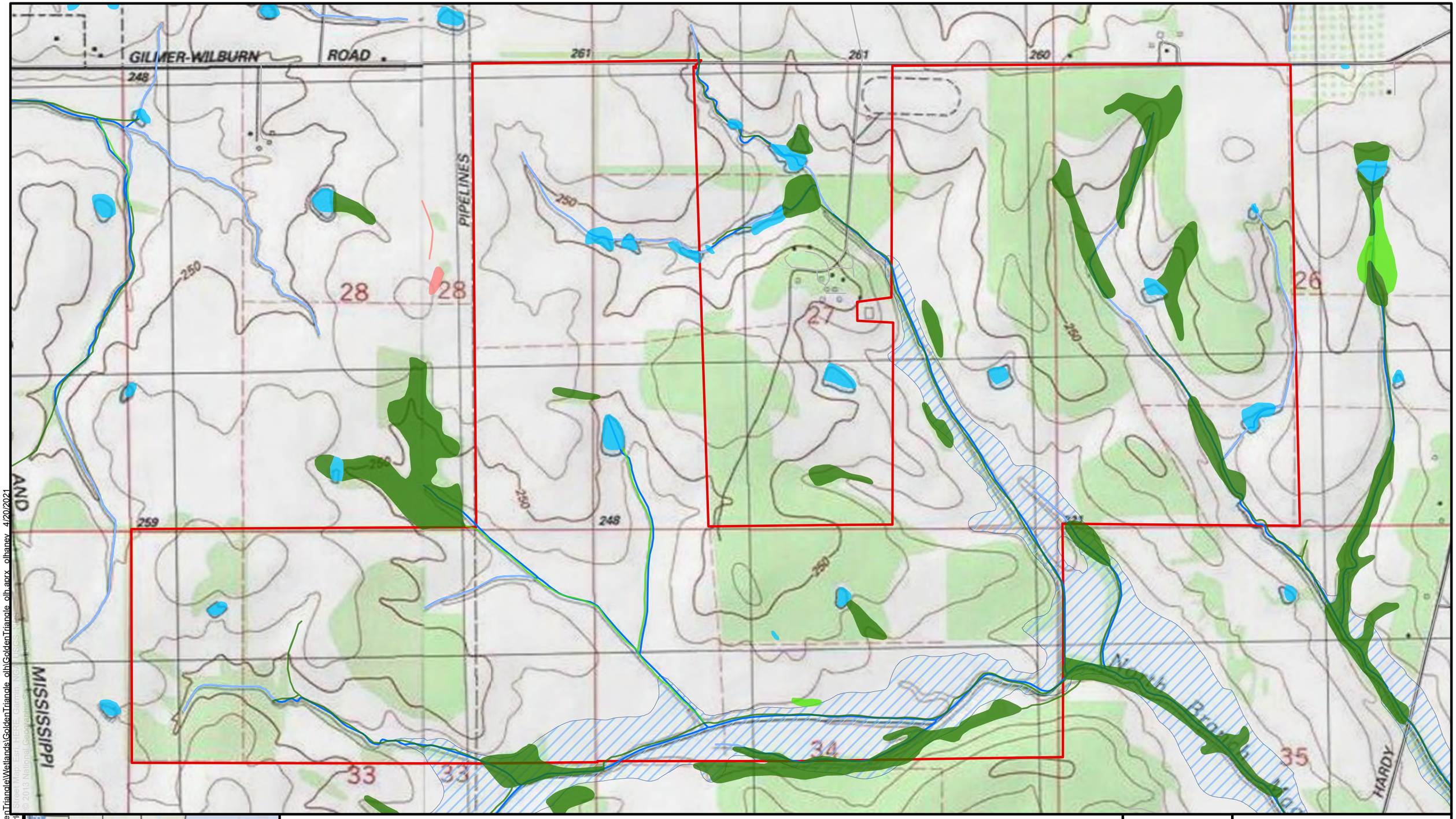
BURNS McDONNELL

Figure A-1
General Vicinity Map
Golden Triangle Phase II
Lowndes County, MS

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/20/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, Origis, Burns & McDonnell

Issued: 4/20/2021





Survey Corridor
100-Year Floodplain
NHD Flowline

NWI Wetlands
PFO
PEM
PSS
PAB
PUB
Lake
Riverine

NORTH
0 500 1,000
Scale in Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, and Topographic Map
Golden Triangle Phase II
Lowndes County, MS

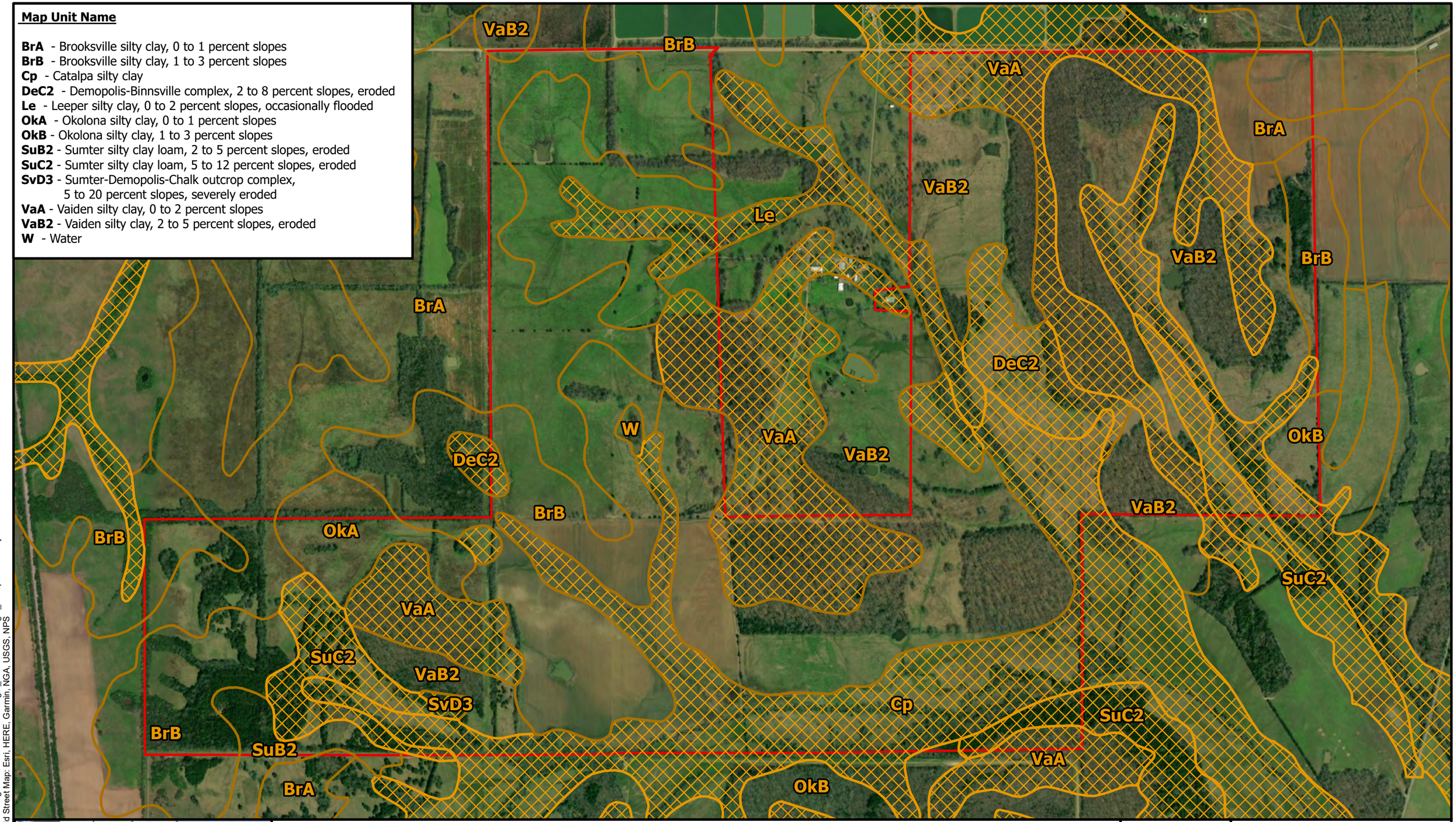
Issued: 4/20/2021

Source: Esri, NHD, NWI, FEMA, Origis, Burns & McDonnell

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhanev 4/20/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, INCREMENT P, © 2013 National Geographic Society, i-cubed

Map Unit Name

BrA - Brooksville silty clay, 0 to 1 percent slopes
BrB - Brooksville silty clay, 1 to 3 percent slopes
Cp - Catalpa silty clay
DeC2 - Demopolis-Binnsville complex, 2 to 8 percent slopes, eroded
Le - Leeper silty clay, 0 to 2 percent slopes, occasionally flooded
OkA - Okolona silty clay, 0 to 1 percent slopes
OkB - Okolona silty clay, 1 to 3 percent slopes
SuB2 - Sumter silty clay loam, 2 to 5 percent slopes, eroded
SuC2 - Sumter silty clay loam, 5 to 12 percent slopes, eroded
SvD3 - Sumter-Demopolis-Chalk outcrop complex, 5 to 20 percent slopes, severely eroded
VaA - Vaiden silty clay, 0 to 2 percent slopes
VaB2 - Vaiden silty clay, 2 to 5 percent slopes, eroded
W - Water





Survey Corridor
Non-Hydric Soil
Hydric Soil

NORTH
0 500 1,000
Scale in Feet

BURNS McDONNELL

Figure A-3
NRCS Soils Map
Golden Triangle Phase II
Lowndes County, MS

Path: C:\ZZ_Projects\GoldenTriangleWetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/20/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, Origis, Burns & McDonnell

Issued: 4/20/2021

W-PUB-03

W-PEM-01

W-PEM-01

W-PEM-01_UPL

W-PUB-02

W-PUB-04

S-01

W-PUB-05

S-03

S-02

S-04

Mississippi

1 2 3 4 5 6 7

Survey Corridor

Sample Plot

Delineated Wetlands

PEM

PUB

Delineated Streams

Intermittent

Ephemeral

NORTH

200 100 0 200

Scale in Feet

BURNS McDONNELL

Figure A-4
Delineated Wetlands and other Water Features
Golden Triangle Phase II
Lowndes County, MS
Page 1 of 7

Path: C:\ZZ_Projects\GoldenTriangleWetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/21/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, USGS NAIP 20200612, Origis, Burns & McDonnell

Issued: 4/21/2021

W-PUB-11

W-PUB-07

SP-UPL-04

S-13

SP-UPL-08

W-PFO-01

W-PFO-01_UPL

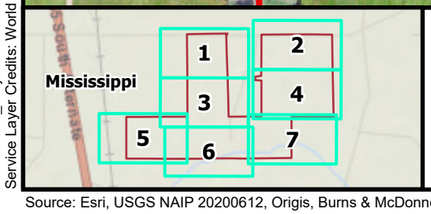
W-PFO-01

SP-UPL-05

S-05

S-14

S-15



Survey Corridor

100-Year Floodplain

Sample Plot

Delineated Wetlands

PFO

PUB

Delineated Streams

Perennial

Intermittent

Ephemeral

NORTH

200 100 0 200

Scale in Feet

BURNS McDONNELL

Figure A-4
Delineated Wetlands and other Water Features
Golden Triangle Phase II
Lowndes County, MS
Page 2 of 7

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/21/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, USGS NAIP 20200612, Origis, Burns & McDonnell

Issued: 4/21/2021

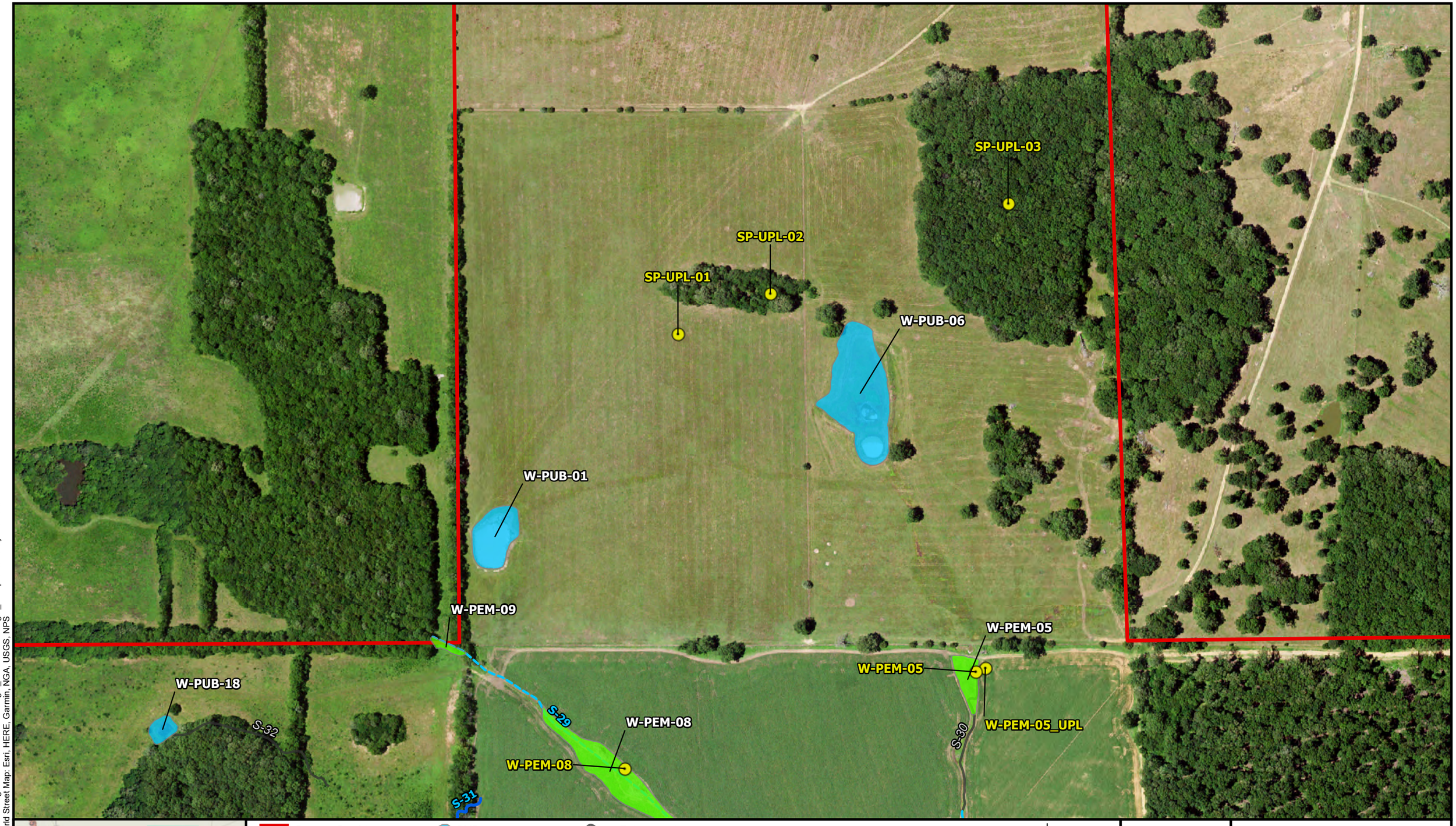


Figure A-4
Delineated Wetlands and other Water Features
Golden Triangle Phase II
Lowndes County, MS
Page 3 of 7

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/21/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, USGS NAIP 20200612, Origis, Burns & McDonnell

Issued: 4/21/2021



Figure A-4
Delineated Wetlands and other Water Features
Golden Triangle Phase II
Lowndes County, MS
Page 4 of 7

Path: C:\ZZ_Projects\GoldenTriangleWetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/21/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, USGS NAIP 20200612, Origis, Burns & McDonnell

Issued: 4/21/2021

W-PEM-09
S-29
W-PUB-18
S-32
W-PEM-06
W-PEM-06
W-PUB-16
S-31
W-PEM-06_UPL
W-PUB-19
S-40
S-56
W-PUB-15
S-43
S-42
S-46
S-45
S-48
S-47
S-44
S-40
S-41
S-49
W-PSS-02
W-PSS-02
S-54
S-39
S-50
S-51
S-52
S-34
S-38
S-35
S-33
S-37
S-36
S-35
S-34
S-53

Mississippi
1
2
3
4
5
6
7

Survey Corridor
100-Year Floodplain
Sample Plot
T&E Sensitive Area

Delineated Wetlands
PEM
PSS
PUB

Delineated Streams
Perennial
Intermittent
Ephemeral

NORTH
200 100 0 200
Scale in Feet

BURNS McDONNELL

Figure A-4
Delineated Wetlands and other Water Features
Golden Triangle Phase II
Lowndes County, MS
Page 5 of 7

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/21/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, USGS NAIP 20200612, Origis, Burns & McDonnell

Issued: 4/21/2021

W-PEM-06
W-PUB-16
S-31
W-PEM-06_UPL
W-PEM-06
S-56
W-PUB-15
S-30
S-30
S-29
W-PUB-13
S-19
W-PFO-03_UPL
W-PFO-03
S-55
W-PFO-03
W-PUB-12
W-PEM-08
W-PEM-07
W-PEM-07_UPL
W-PEM-07
W-PEM-08_UPL
W-PEM-08_2
W-PUB-20
S-28
S-16
S-36
S-35
S-37
S-35
S-35
S-33
S-53
W-PFO-05
W-PFO-05
W-PFO-05_UPL
W-PEM-10
W-PEM-10
W-PSS-01
W-PSS-01
W-PSS-01_UPL
W-PUB-17
S-23
S-27
S-26
S-51

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/21/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Mississippi
1
2
3
4
5
6
7

Survey Corridor
100-Year Floodplain
Sample Plot

Delineated Wetlands
PEM
PFO
PSS
PUB

Delineated Streams
Perennial
Intermittent
Ephemeral

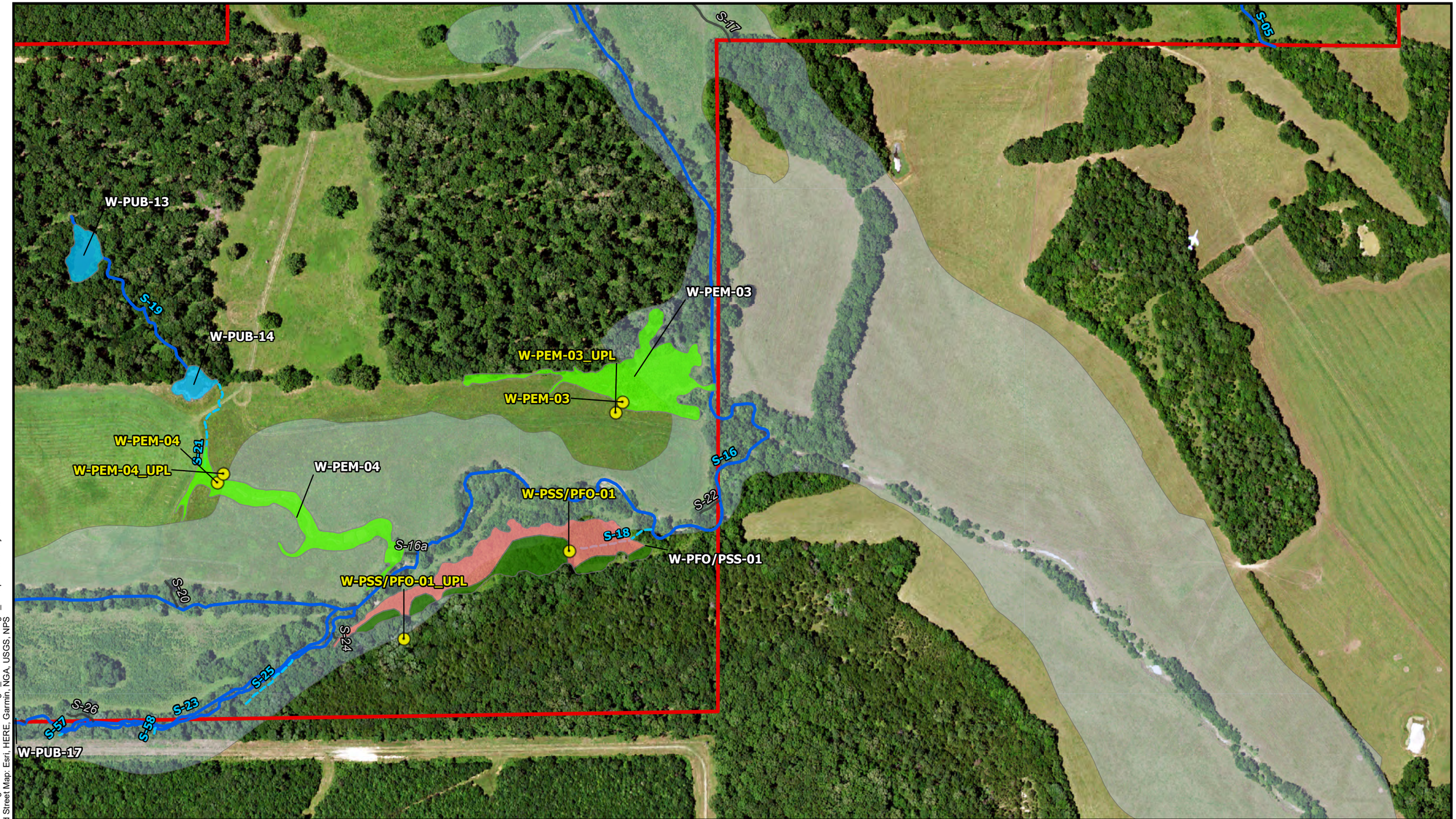
NORTH
200 100 0 200
Scale in Feet

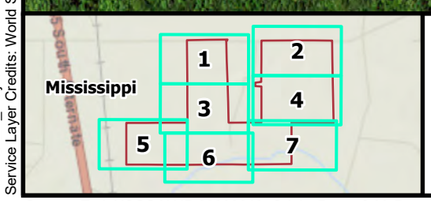
BURNS McDONNELL

Figure A-4
Delineated Wetlands and other Water Features
Golden Triangle Phase II
Lowndes County, MS
Page 6 of 7

Source: Esri, USGS NAIP 20200612, Origis, Burns & McDonnell

Issued: 4/21/2021





Survey Corridor
100-Year Floodplain
Sample Plot

Delineated Wetlands
PEM
PFO
PSS
PUB

Delineated Streams
Perennial
Intermittent
Ephemeral

NORTH
200 100 0 200
Scale in Feet

BURNS McDONNELL

Figure A-4
Delineated Wetlands and other Water Features
Golden Triangle Phase II
Lowndes County, MS
Page 7 of 7

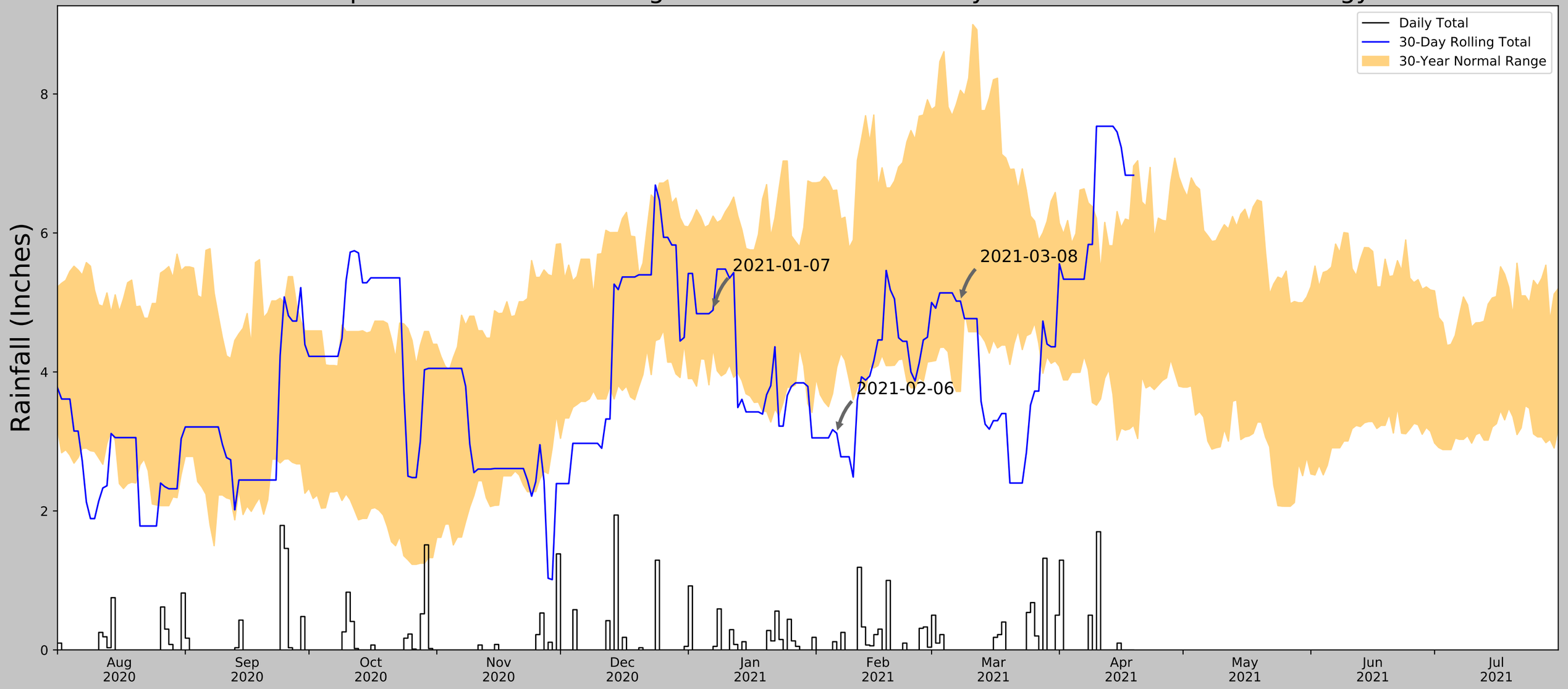
Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/21/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, USGS NAIP 20200612, Origis, Burns & McDonnell

Issued: 4/21/2021

APPENDIX B - ANTECEDENT PRECIPITATION TOOL ANALYSIS

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



Coordinates	33.3908901, -88.6113077
Observation Date	2021-03-08
Elevation (ft)	248.73
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-03-08	3.719685	8.05315	5.019685	Normal	2	3	6
2021-02-06	4.066536	6.616536	3.11811	Dry	1	2	2
2021-01-07	4.337402	6.242914	4.889764	Normal	2	1	2
Result							Normal Conditions - 10

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
STATE UNIV	33.4692, -88.7822	185.039	11.242	63.691	5.775	10602	88
CRAWFORD 5 W	33.2783, -88.7061	252.953	9.511	4.223	4.32	607	0
STARKVILLE 4.7 SE	33.4033, -88.773	288.058	9.366	39.328	4.583	38	0
STARKVILLE 6.3 SSE	33.3673, -88.7975	305.118	10.866	56.388	5.502	54	0
STARKVILLE 5.3 S	33.3808, -88.8091	314.961	11.432	66.231	5.902	52	2

APPENDIX C - REPRESENTATIVE PHOTOGRAPHS



Photograph C-1: View of intermittent stream (S)-01, looking west.



Photograph C-2: View of intermittent S-02, looking east.



Photograph C-3: View of intermittent S-03, looking south.



Photograph C-4: View of ephemeral S-04, looking north.



Photograph C-5: View of perennial S-05, facing north.



Photograph C-6: View of intermittent S-06, facing east.



Photograph C-7: View of intermittent S-07, facing south.



Photograph C-8: View of ephemeral S-08, facing south.



Photograph C-9: View of intermittent S-12, facing east.



Photograph C-10: View of ephemeral S-13, facing northeast.



Photograph C-11: View of ephemeral portion of S-14, facing north.



Photograph C-12: View of intermittent portion of S-14, facing south.



Photograph C-13: View of ephemeral S-15, facing south.



Photograph C-14: View of perennial S-16, facing south.



Photograph C-15: View of culvert outlet from ephemeral S-16a into perennial S-16, facing southwest.



Photograph C-16: View of ephemeral S-17, facing northwest.



Photograph C-17: View of intermittent S-18, facing north.



Photograph C-18: View of intermittent S-19, facing south.



Photograph C-19: View of ephemeral S-20, facing northwest.



Photograph C-20: View of intermittent S-21, facing south.



Photograph C-21: View of ephemeral S-22, facing northwest.



Photograph C-22: View of perennial S-23, facing east.



Photograph C-23: View of ephemeral S-24, facing northwest.



Photograph C-24: View of intermittent S-25, facing northeast.



Photograph C-25: View of ephemeral S-26, facing southeast.



Photograph C-26: View of intermittent S-28, facing north.



Photograph C-27: View of intermittent S-29, facing southeast.



Photograph C-28: View of ephemeral S-30, facing south.



Photograph C-29: View of perennial S-31, facing northeast.



Photograph C-30: View of ephemeral S-32, facing northwest.



Photograph C-31: View of perennial S-33, facing northwest.



Photograph C-32: View of ephemeral portion of S-34, facing north.



Photograph C-33: View of intermittent portion of S-34, facing north.



Photograph C-34: View of intermittent S-35, facing west.



Photograph C-35: View of ephemeral S-36, facing south.



Photograph C-36: View of ephemeral S-37, facing south.



Photograph C-37: View of ephemeral S-38, facing south.



Photograph C-38: View of ephemeral S-39, facing east.



Photograph C-39: View of ephemeral portion of S-40, facing north.



Photograph C-40: View of intermittent portion of S-40, facing west.



Photograph C-41: View of ephemeral portion of S-41, facing northwest.



Photograph C-42: View of intermittent S-42, facing south.



Photograph C-43: View of ephemeral S-43, facing south.



Photograph C-44: View of intermittent S-44, facing southeast.



Photograph C-45: View of ephemeral S-45, facing southeast.



Photograph C-46: View of ephemeral S-46, facing southeast.



Photograph C-47: View of ephemeral S-47, facing southeast.



Photograph C-48: View of ephemeral S-48, facing north.



Photograph C-49: View of ephemeral S-49, facing northeast.



Photograph C-50: View of intermittent S-50, facing east.



Photograph C-51: View of ephemeral S-51, facing north.



Photograph C-52: View of ephemeral S-52, facing north.



Photograph C-53: View of ephemeral S-53, facing north.



Photograph C-54: View of ephemeral S-54, facing north.



Photograph C-55: View of ephemeral S-55, facing northeast.



Photograph C-56: View of ephemeral S-56, facing northwest.



Photograph C-57: View of intermittent S-57, facing north.



Photograph C-58: View of intermittent S-58, facing south.



Photograph C-59: View of wetland (W)-PAB-1, facing northeast.



Photograph C-60: View of W-PUB-01, facing north.



Photograph C-61: View of W-PUB-02, facing east.



Photograph C-62: View of W-PUB-03, facing northwest.



Photograph C-63: View of W-PUB-04, facing southeast.



Photograph C-64: View of W-PUB-05, facing southwest.



Photograph C-65: View of W-PUB-06, facing southwest.



Photograph C-66: View of W-PUB-07, facing southwest.



Photograph C-67: View of W-PUB-08, facing southwest.


Photograph C-68: View of W-PUB-09, facing east.



Photograph C-69: View of W-PUB-10, facing northeast.



Photograph C-70: View of W-PUB-11, facing southeast.



Photograph C-71: View of W-PUB-12, facing southwest.



Photograph C-72: View of W-PUB-13, facing south.



Photograph C-73: View of W-PUB-14, facing north.



Photograph C-74: View of W-PUB-15, facing southeast.



Photograph C-75: View of W-PUB-16, facing northwest.



Photograph C-76: View of W-PUB-17, facing northwest.



Photograph C-77: View of W-PUB-18, facing west.



Photograph C-78: View of W-PUB-19, facing north.



Photograph C-79: View of W-PUB-20, facing northeast.



Photograph C-80: View of sample plot in W-PEM-01, facing east.



Photograph C-81: View of upland sample plot adjacent to W-PEM-01, facing south.



Photograph C-82: View of sample plot in W-PEM-02, facing northwest.



Photograph C-83: View of upland sample plot adjacent to W-PEM-02, facing north.



Photograph C-84: View of flooded portion of W-PEM-03, facing west.



Photograph C-85: View of upland sample plot adjacent to W-PEM-03, facing northwest.



Photograph C-86: View of sample plot in W-PEM-04, facing northwest.



Photograph C-87: View of upland sample plot adjacent to W-PEM-04, facing south.



Photograph C-88: View of sample plot in W-PEM-05, facing west.



Photograph C-89: View of upland sample plot adjacent to W-PEM-05, facing south.



Photograph C-90: View of W-PEM-06, facing southwest.



Photograph C-91: View of upland area adjacent to W-PEM-06, facing north.



Photograph C-92: View of W-PEM-07, facing east.



Photograph C-93: View of upland fallow field adjacent to W-PEM-07, facing northeast.



Photograph C-94: View of W-PEM-08, facing south.



Photograph C-95: View of upland field adjacent to W-PEM-08, facing east.



Photograph C-96: View of W-PEM-09, facing northwest.



Photograph C-97: View of W-PEM-10, facing southeast.



Photograph C-98: View of W-PSS-01, facing south.



Photograph C-99: View of upland area adjacent to W-PSS-01, facing southeast.



Photograph C-100: View of W-PSS-02, facing southeast.



Photograph C-101: View of W-PFO-01, facing west.



Photograph C-102: View of upland sample plot adjacent to W-PFO-01, facing southwest.



Photograph C-103: View of flooded W-PFO-02, facing southeast.



Photograph C-104: View of flooded W-PFO-03, facing northeast.



Photograph C-105: View of upland area adjacent to W-PFO-03, facing northwest.



Photograph C-106: View of W-PFO-04, facing southeast.



Photograph C-107: View of W-PFO-05, facing south.



Photograph C-108: View of upland area adjacent to W-PFO-05, facing northeast.



Photograph C-109: View of W-PSS/PFO-1, facing northwest.



Photograph C-110: View of upland sample plot adjacent to W-PSS/PFO-1, facing north.



Photograph C-111: View of upland confirmation sample plot, SP-UPL-01, facing southeast.



Photograph C-112: View of upland confirmation sample plot, SP-UPL-02, facing north.



Photograph C-113: View of upland confirmation sample plot, SP-UPL-03, facing southwest.



Photograph C-114: View of upland confirmation sample plot, SP-UPL-04, facing north.



Photograph C-115: View of upland confirmation sample plot, SP-UPL-05, facing west.



Photograph C-116: View of upland confirmation sample plot, SP-UPL-06, facing south.



Photograph C-117: View of upland confirmation sample plot, SP-UPL-07, facing south.



Photograph C-118: View of upland confirmation sample plot, SP-UPL-08, facing southwest.

APPENDIX D - REPRESENTATIVE WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-08

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-01

Investigator(s): J. Brown, O. Haney Section, Township, Range: S28 T18N R16E

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.392825 Long: -88.620201 Datum: NAD 83

Soil Map Unit Name: Brooksville silty clay, 0 to 1 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: SP-UPL-01

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Schedonorus arundinaceus	60	✔	FAC
2. Schizachyrium scoparium	30	✔	FACU
3. Elymus hystrix	5		UPL
4. Elymus repens	5		FACU
5. Poa annua	5		FACU
6. Ranunculus acris	5		FACW
7.			
8.			
9.			
10.			
11.			
12.			
	110% = Total Cover		
50% of total cover: 55	20% of total cover: 22		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	60	x 3 =	180
FACU species	40	x 4 =	160
UPL species	5	x 5 =	25
Column Totals:	110 (A)		375 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: SP-UPL-01

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 3/2	100					Clay Loam	
10 - 18	10YR 3/2	80	5YR 4/6	20	C	M	Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-08

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-02

Investigator(s): J. Brown, O. Haney Section, Township, Range: S28 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.393263 Long: -88.620201 Datum: NAD 83

Soil Map Unit Name: Brooksville silty clay, 1 to 3 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP-UPL-02

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Maclura pomifera	60	✔	FACU
2. Celtis laevigata	10		FACW
3. Juniperus virginiana	10		FACU
4. Gleditsia triacanthos	5		FAC
5.			
6.			
7.			
8.			
	85%	= Total Cover	
50% of total cover: 43	20% of total cover: 17		

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Herb Stratum (Plot size: 5 ft r)			
1. Schedonorus arundinaceus	60	✔	FAC
2. Ligustrum sinense	20	✔	FAC
3. Rumex crispus	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85%	= Total Cover	
50% of total cover: 43	20% of total cover: 17		

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	90	x 3 =	270
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	170 (A)		570 (B)

Prevalence Index = B/A = 3.35

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: SP-UPL-02

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/2	98	10YR 3/3	2	C	M	Clay Loam	
6 - 18	10YR 3/3	60	10YR 2/2	35	C	M	Clay Loam	Compact
6 - 18			7.5YR 4/6	5	C	M		
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-08

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-03

Investigator(s): J. Brown, O. Haney Section, Township, Range: S27 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.394241 Long: -88.615904 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 0 to 2 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP-UPL-03

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	40	✔	FACU
2. Carya ovata	20	✔	FACU
3. Ulmus americana	5		FAC
4.			
5.			
6.			
7.			
8.			
	65%	= Total Cover	
50% of total cover: 33	20% of total cover: 13		

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Herb Stratum (Plot size: 5 ft r)			
1. Lonicera japonica	2	✔	FACU
2. Smilax rotundifolia	2	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	4%	= Total Cover	
50% of total cover: 2	20% of total cover: 1		

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	7	x 3 =	21
FACU species	62	x 4 =	248
UPL species	0	x 5 =	0
Column Totals:	69 (A)		269 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No indicators are met.

SOIL

Sampling Point: SP-UPL-03

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/4	80					Clay Loam	Mixed Matrix
0 - 18	5PB 4/1	20						
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-09

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-04

Investigator(s): J. Brown, O. Haney Section, Township, Range: S27 T18N R16E

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): P 135A Lat: 33.399966 Long: -88.605254 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 2 to 5 percent slopes, eroded NWI classification: NA

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: SP-UPL-04

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Schedonorus arundinaceus	70	✔	FAC
2. Setaria italica	35	✔	FACU
3. Ambrosia artemisiifolia	15		FACU
4. Schizachyrium scoparium	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	125% = Total Cover		
50% of total cover: 62.5	20% of total cover: 25		
Woody Vine Stratum (Plot size: 30 ft r)			
1. Rubus sp.	5	✔	
2.			
3.			
4.			
5.			
	5% = Total Cover		
50% of total cover: 3	20% of total cover: 1		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	125 (A)		430 (B)

Prevalence Index = B/A = 3.44

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: SP-UPL-04

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-09

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-05

Investigator(s): J. Brown, O. Haney Section, Township, Range: S27 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.398183 Long: -88.602480 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 0 to 2 percent slopes NWI classification: NA

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP-UPL-05

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	30	✔	FACU
2. Quercus velutina	30	✔	UPL
3. Carya ovata	5		FACU
4. Quercus phellos	5		FACW
5. Quercus stellata	5		UPL
6. Ulmus americana	5		FAC
7.			
8.			
	80% = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Carex sp.*	5	✔	FAC
2. Smilax rotundifolia	2	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	7% = Total Cover		
50% of total cover: 4	20% of total cover: 1		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	12	x 3 =	36
FACU species	35	x 4 =	140
UPL species	35	x 5 =	175
Column Totals:	87 (A)		361 (B)

Prevalence Index = B/A = 4.15

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met. *The Carex could not be identified to species. It was assumed to be FAC since most species in the area are FAC or wetter.

SOIL

Sampling Point: SP-UPL-05

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/4	50					Clay Loam	
0 - 6	10YR 5/3	50						
6 - 18	10YR 6/6	50	7.5YR 4/6	30	C	M	Silty Clay Loam	
6 - 18			2.5Y 6/1	20	D	M		
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-06

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.397531 Long: -88.596764 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 0 to 2 percent slopes NWI classification: PFO1A

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

Indicator B10 is met. There were pockets of standing water (<2") in some microdepressions within the forested area. The standing water was not associated with a high water table meaning it can not be used as an indication of wetland hydrology. Wetland hydrology is not met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP-UPL-06

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	50	✔	FACU
2. Quercus pagoda	20	✔	FACW
3. Quercus stellata	10		UPL
4.			
5.			
6.			
7.			
8.			
	80% = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Celtis laevigata	20	✔	FACW
2. Carya ovata	10	✔	FACU
3. Ulmus alata	10	✔	FACU
4. Ligustrum sinense	5		FAC
5.			
6.			
7.			
8.			
	45% = Total Cover		
50% of total cover: 23	20% of total cover: 9		
Herb Stratum (Plot size: 5 ft r)			
1. Ligustrum sinense	30	✔	FAC
2. Carex sp.*	5		FAC
3. Viola sororia	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40% = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	45	x 3 =	135
FACU species	70	x 4 =	280
UPL species	10	x 5 =	50
Column Totals:	165 (A)		545 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: SP-UPL-06

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 24	10YR 3/2	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-07

Investigator(s): J. Brown, O. Haney Section, Township, Range: S27 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.395583 Long: -88.605862 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 2 to 5 percent slopes, eroded NWI classification: PFO1A

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met. Standing water was present within microdepressions within the forested area. The standing water was not associated with a high water table, so it can not be used as an indicator of wetland hydrology.

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

Sampling Point: SP-UPL-07

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Maclura pomifera	30	✔	FACU
2. Celtis laevigata	20	✔	FACW
3. Fagus grandifolia	20	✔	FACU
4.			
5.			
6.			
7.			
8.			
	70%	= Total Cover	
50% of total cover: 35	20% of total cover: 14		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Celtis laevigata	15	✔	FACW
2. Ligustrum sinense	15	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	30%	= Total Cover	
50% of total cover: 15	20% of total cover: 6		
Herb Stratum (Plot size: 5 ft r)			
1. Packera glabella	60	✔	OBL
2. Rumex crispus	15	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75%	= Total Cover	
50% of total cover: 38	20% of total cover: 15		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	35	x 2 =	70
FAC species	30	x 3 =	90
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	175 (A)		420 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: SP-UPL-07

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/2	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: SP-UPL-08

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): P 135A Lat: 33.399100 Long: -88.598783 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: PFO1A

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

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

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

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

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

Remarks:

Upland confirmation sample plot. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

Geomorphic position present. Wetland hydrology not met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP-UPL-08

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis laevigata	40	✔	FACW
2. Maclura pomifera	20	✔	FACU
3. Juniperus virginiana	5		FACU
4. Quercus pagoda	5		FACW
5. Ulmus americana	5		FAC
6.			
7.			
8.			
	75% = Total Cover		
50% of total cover: 38	20% of total cover: 15		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Juniperus virginiana	5	✔	FACU
2. Ligustrum sinense	2	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	7% = Total Cover		
50% of total cover: 4	20% of total cover: 1		
Herb Stratum (Plot size: 5 ft r)			
1. Carex sp.*	65	✔	FAC
2. Poa annua	25	✔	FACU
3. Ligustrum sinense	15		FAC
4. Claytonia virginica	5		FACU
5. Plantago virginica	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	115% = Total Cover		
50% of total cover: 58	20% of total cover: 23		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	87	x 3 =	261
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	197 (A)		611 (B)

Prevalence Index = B/A = 3.1

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met. *The Carex could not be identified to species. It was assumed to be FAC since most Carex in the area are FAC or wetter.

SOIL

Sampling Point: SP-UPL-08

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	98	10YR 3/4	2	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-08

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-01

Investigator(s): J. Brown, O. Haney Section, Township, Range: S28 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.398573 Long: -88.620082 Datum: NAD 83

Soil Map Unit Name: Leeper silty clay, 0 to 2 percent slopes, occasionally flooded NWI classification: N/A

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

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

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

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

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

Remarks:

Sample plot in W-PEM-1. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☑ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 2
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PEM-01

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Andropogon glomeratus	40	✔	FACW
2. Alternanthera philoxeroides	35	✔	OBL
3. Lysimachia nummularia	10		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85% = Total Cover		
50% of total cover: 43	20% of total cover: 17		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		135 (B)

Prevalence Index = B/A = 1.6

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Rapid test is met.

SOIL

Sampling Point: W-PEM-01

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Soil sample was not taken due to inundation.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-08

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-01_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR or MLRA): P 135A Lat: 33.398610 Long: -88.620228 Datum: NAD 83

Soil Map Unit Name: Leeper silty clay, 0 to 2 percent slopes, occasionally flooded NWI classification: N/A

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-1. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PEM-01_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft r)			
1. Setaria pumila	40	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40% = Total Cover		

50% of total cover: 20 20% of total cover: 8

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		120 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-01_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-02

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.396049 Long: -88.598868 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-02. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-02

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Salix nigra	60	✔	OBL
2. Ambrosia trifida	30	✔	FAC
3. Eleocharis palustris	15		OBL
4. Cyperus rotundus	10		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	115% = Total Cover		
50% of total cover: 58	20% of total cover: 23		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		195 (B)

Prevalence Index = B/A = 1.7

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-02

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	60	10YR 3/6	40	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-02_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.396092 Long: -88.598834 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-02. The area was a maintained pasture area. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PEM-02_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Schedonorus arundinaceus	70	✔	FAC
2. Schizachyrium scoparium	15		FACU
3. Allium vineale	5		FACU
4. Ligustrum sinense	5		FAC
5. Rosa multiflora	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100% = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	100 (A)		325 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-02_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-03

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.385592 Long: -88.602364 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-03. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ✔ No _____ Depth (inches): 1

Water Table Present? Yes ✔ No _____ Depth (inches): 0

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

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PEM-03

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Salix nigra	50	✔	OBL
2. Carex lurida	30	✔	OBL
3. Leersia oryzoides	20		OBL
4. Alternanthera philoxeroides	10		OBL
5. Packera glabella	5		OBL
6. Xanthium strumarium	5		FAC
7.			
8.			
9.			
10.			
11.			
12.			
	120% = Total Cover		
50% of total cover: 60	20% of total cover: 24		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	115	x 1 =	115
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		130 (B)

Prevalence Index = B/A = 1.08

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Rapid test is met.

SOIL

Sampling Point: W-PEM-03

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/1	60	10YR 3/6	40	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicators A4 and F6 are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-03_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.385479 Long: -88.602457 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-03. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PEM-03_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Cynodon dactylon	50	✔	FACU
2. Ranunculus abortivus	40	✔	FACW
3. Setaria faberi	30	✔	UPL
4. Schedonorus arundinaceus	15		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	135% = Total Cover		
50% of total cover: 68	20% of total cover: 27		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	15	x 3 =	45
FACU species	50	x 4 =	200
UPL species	30	x 5 =	150
Column Totals:	135 (A)		475 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: W-PEM-03_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/2	95	10YR 3/6	5	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-04

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.384726 Long: -883607637 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-04. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): .5	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-04

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Xanthium strumarium	30	✔	FAC
2. Leersia oryzoides	20	✔	OBL
3. Carex lurida	15	✔	OBL
4. Alternanthera philoxeroides	10		OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75% = Total Cover		
50% of total cover: 38	20% of total cover: 15		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	75 (A)		135 (B)

Prevalence Index = B/A = 1.8

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. 25% coverage by open water.

SOIL

Sampling Point: W-PEM-04

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/1	70	10YR 3/6	30	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicators A4 and F6 are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-04_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.384821 Long: -88.607555 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-04. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PEM-04_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Cynodon dactylon	50	✔	FACU
2. Ranunculus abortivus	40	✔	FACW
3. Setaria faberi	30	✔	UPL
4. Schedonorus arundinaceus	15		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	135% = Total Cover		
50% of total cover: 68	20% of total cover: 27		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	15	x 3 =	45
FACU species	50	x 4 =	200
UPL species	30	x 5 =	150
Column Totals:	135 (A)		475 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: W-PEM-04_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/2	95	10YR 3/6	5	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-05

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.389135 Long: -88.616338 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-05. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-05

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon glomeratus	40	✔	FACW
2. Ambrosia trifida	25	✔	FAC
3. Ludwigia alternifolia	20	✔	OBL
4. Carex lurida	5		OBL
5. Packera glabella	5		OBL
6. Rumex crispus	5		FAC
7.			
8.			
9.			
10.			
11.			
12.			
	100% = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	40	x 2 =	80
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-05

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/1	70	10YR 3/6	30	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-05_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.389178 Long: -88.616214 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-05. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-05_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Packera glabella	60	✔	FACW
2. Lamium amplexicaule	10		UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70% = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	70 (A)		170 (B)

Prevalence Index = B/A = 2.43

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Rapid test is met. Sample plot was taken in corn field. There was open soil and dead corn stalks.

SOIL

Sampling Point: W-PEM-05_UPL

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	100					Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-06

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): P 135A Lat: 33.387292 Long: -88.624276 Datum: NAD 83

Soil Map Unit Name: Okolona silty clay, 0 to 1 percent slopes NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-06. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 2
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PEM-06

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30 ft r)			
1. Carex lurida	40	✔	OBL
2. Leersia oryzoides	25	✔	OBL
3. Alternanthera philoxeroides	15		OBL
4. Xanthium strumarium	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85% = Total Cover		

50% of total cover: 43 20% of total cover: 17

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		95 (B)

Prevalence Index = B/A = 1.1

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (If observed, list morphological adaptations below).

Rapid test is met.

SOIL

Sampling Point: W-PEM-06

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/1	80	10YR 3/6	20	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicators A4 and F6 are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-06_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.387363 Long: -88.624307 Datum: NAD 83

Soil Map Unit Name: Okolona silty clay, 0 to 1 percent slopes NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-06. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PEM-06_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Cynodon dactylon	50	✔	FACU
2. Setaria faberi	40	✔	UPL
3. Schedonorus arundinaceus	20		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110% = Total Cover		
50% of total cover: 55	20% of total cover: 22		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	50	x 4 =	200
UPL species	40	x 5 =	200
Column Totals:	110 (A)		460 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: W-PEM-06_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-07

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Fringe Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.3841858 Long: -88.6202718 Datum: NAD 83

Soil Map Unit Name: Brooksville silty clay, 1 to 3 percent slopes NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-07. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 2
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PEM-07

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Salix nigra	5	✔	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
50% of total cover: 3	20% of total cover: 1		
Herb Stratum (Plot size: 5 ft r)			
1. Packera glabella	35	✔	OBL
2. Cyperus esculentus	30	✔	FAC
3. Salix nigra	2		OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	67% = Total Cover		
50% of total cover: 34	20% of total cover: 13		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	42	x 1 =	42
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	72 (A)		132 (B)

Prevalence Index = B/A = 1.83

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-07

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Sample plot was inundated and no soil sample was taken. Indicator A4 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-07_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.3957825 Long: -88.6267049 Datum: NAD 83

Soil Map Unit Name: Brooksville silty clay, 1 to 3 percent slopes NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-07. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PEM-07_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft r)			
1. Lamium amplexicaule	10	✔	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10% = Total Cover		

50% of total cover: 5 20% of total cover: 2

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	10 (A)		50 (B)

Prevalence Index = B/A = 5.0

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met. Sample plot was taken in corn field. There was open soil and dead corn stalks.

SOIL

Sampling Point: W-PEM-07_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	100					Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-08

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): P 135A Lat: 33.388090 Long: -88.620906 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-08. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 3	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-08

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon glomeratus	50	✔	FACW
2. Ambrosia trifida	40	✔	FAC
3. Plantago virginica	5		FACU
4. Typha latifolia	5		OBL
5. Xanthium strumarium	5		FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105% = Total Cover		
50% of total cover: 53	20% of total cover: 21		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	50	x 2 =	100
FAC species	45	x 3 =	135
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	105 (A)		260 (B)

Prevalence Index = B/A = 2.48

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-08

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

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

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Soil sample was not taken due to inundation. Hydric soil assumed due to prevalence of wetland hydrology and hydrophytic vegetation.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-08_2

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): P 135A Lat: 33.383191 Long: -88.614966 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-08. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-08_2

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Ambrosia trifida	40	✔	FAC
2. Andropogon glomeratus	25	✔	FACW
3. Rumex crispus	15		FAC
4. Setaria pumila	15		FAC
5. Cyperus esculentus	5		FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100% = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		275 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-08_2

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

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

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Soil sample was not taken due to inundation. Hydric soil assumed due to prevalence of wetland hydrology and hydrophytic vegetation.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-08_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.383592 Long: -88.614510 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PEM-08. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PEM-08_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Trifolium repens	75	✔	FACU
2. Cynodon dactylon	15		FACU
3. Setaria pumila	15		FAC
4. Rumex crispus	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110% = Total Cover		
50% of total cover: 55	20% of total cover: 22		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	110 (A)		420 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: W-PEM-08_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-09

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.389415 Long: -88.623213 Datum: NAD 83

Soil Map Unit Name: Brooksville silty clay, 1 to 3 percent slopes NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-09. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-09

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Fraxinus pennsylvanica	10	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10% = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Herb Stratum (Plot size: 5 ft r)			
1. Ambrosia trifida	60	✔	FAC
2. Persicaria hydropiperoides	10		OBL
3. Fraxinus pennsylvanica	5		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75% = Total Cover		
50% of total cover: 38	20% of total cover: 15		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	15	x 2 =	30
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		220 (B)

Prevalence Index = B/A = 2.59

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PEM-09

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

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

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No soil sample taken due to proximity to underground natural gas pipelines. Hydric soil is assumed due to prevalence of wetland hydrology indicators and hydrophytic vegetation.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-09_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range:

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

Subregion (LRR or MLRA): P 135A Lat: 33.3957825 Long: -88.6267049 Datum: NAD 83

Soil Map Unit Name: NWI classification:

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

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

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

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

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

Remarks:

The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes No ✔

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

Remarks:

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

Sampling Point: W-PEM-09_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 0 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = nan

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W-PEM-09_UPL

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PEM-10

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): P 135A Lat: 33.382376 Long: -88.614745 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PEM-10. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 3
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PEM-10

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Alternanthera philoxeroides	10	✔	OBL
2. Juncus effusus	10	✔	OBL
3. Xanthium strumarium	10	✔	FAC
4. Persicaria hydropiperoides	5		OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35% = Total Cover		
50% of total cover: 18	20% of total cover: 7		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	35 (A)		55 (B)

Prevalence Index = B/A = 1.57

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. More than 40% coverage of open water.

SOIL

Sampling Point: W-PEM-10

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

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

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No soil sample was taken due to inundation. Hydro soil is assumed due to the prevalence of wetland hydrology and hydrophytic vegetation.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-09

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-01

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.399314 Long: -88.593858 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 2 to 5 percent slopes, eroded NWI classification: PUBHh

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

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

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

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

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

Remarks:

Sample plot in W-PFO-01. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 2	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PFO-01

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	35	✔	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	35% = Total Cover		
50% of total cover: 18	20% of total cover: 7		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Salix nigra	5	✔	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
50% of total cover: 3	20% of total cover: 1		
Herb Stratum (Plot size: 5 ft r)			
1. Cyperus esculentus	10	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10% = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	50 (A)		70 (B)

Prevalence Index = B/A = 1.4

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PFO-01

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 24	10YR 4/2	75	7.5YR 5/6	25	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F3 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-09

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-01_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR or MLRA): P 135A Lat: 33.399392 Long: -88.593800 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 2 to 5 percent slopes, eroded NWI classification: PUBHh

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PFO-01. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PFO-01_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana	60	✔	FACU
2. Celtis laevigata	5		FACW
3.			
4.			
5.			
6.			
7.			
8.			
	65%	= Total Cover	

50% of total cover: 33 20% of total cover: 13

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft r)			
1. Rubus argutus	2	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	2%	= Total Cover	

50% of total cover: 1 20% of total cover: 0

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	2	x 3 =	6
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	67 (A)		256 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (If observed, list morphological adaptations below).

No indicators are met.

SOIL

Sampling Point: W-PFO-01_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 3/3	100					Silty Clay Loam	Fill present
8 - 14	10YR 3/2	35					Silty Clay Loam	mixed matrix. fill present
8 - 14	10YR 6/1	35						
8 - 14	10YR 6/6	30						
14 - 18	10YR 6/1	60	10YR 6/6	30	C	M	Silty Clay Loam	fill present
14 - 18			10YR 3/2	10	C	M		
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-09

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-02

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR or MLRA): P 135A Lat: 33.393194 Long: -88.593366 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: PUBHh

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

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

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

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

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

Remarks:

Sample plot in W-PFO-02. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes ✔	No _____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met. Additional indicators included buttressing of tree trunks within the wetland.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PFO-02

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis laevigata	60	✔	FACW
2. Juniperus virginiana	20	✔	FACU
3. Acer negundo	10		FAC
4.			
5.			
6.			
7.			
8.			
	90%	= Total Cover	
50% of total cover: 45	20% of total cover: 18		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Celtis laevigata	20	✔	FACW
2. Ulmus americana	10	✔	FAC
3. Ligustrum sinense	5		FAC
4.			
5.			
6.			
7.			
8.			
	35%	= Total Cover	
50% of total cover: 18	20% of total cover: 7		
Herb Stratum (Plot size: 5 ft r)			
1. Plantago cordata	35	✔	OBL
2. Packera glabella	30	✔	OBL
3. Juncus effusus	5		OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70%	= Total Cover	
50% of total cover: 35	20% of total cover: 14		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	80	x 2 =	160
FAC species	25	x 3 =	75
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	195 (A)		385 (B)

Prevalence Index = B/A = 1.97

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PFO-02

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/1	70	10YR 3/8	30	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-03

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.393194 Long: -88.593366 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 2 to 5 percent slopes, eroded NWI classification: PUBHh

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

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

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

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

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

Remarks:

Sample plot in W-PFO-03. The APT showed normal conditions at the time leading up to and during the field survey

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 5	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PFO-03

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	30	✔	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	30%	= Total Cover	

50% of total cover: 15 20% of total cover: 6

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft r)			
1. Alternanthera philoxeroides	10	✔	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10%	= Total Cover	

50% of total cover: 5 20% of total cover: 2

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		40 (B)

Prevalence Index = B/A = 1.0

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (If observed, list morphological adaptations below).

Rapid test is met.

SOIL

Sampling Point: W-PFO-03

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Soil sample not taken due to inundation. Hydric soils assumed due to prevalence of hydrophytic vegetation and wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-08

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-04

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.392007 Long: -88.595565 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: PFO1A

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

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

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

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

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

Remarks:

Sample plot in W-PFO-04. The APT showed normal conditions at the time leading up to and during the field survey

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PFO-04

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	30	✔	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	30%	= Total Cover	

50% of total cover: 15 20% of total cover: 6

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft r)			
1. Alternanthera philoxeroides	10	✔	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10%	= Total Cover	

50% of total cover: 5 20% of total cover: 2

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		40 (B)

Prevalence Index = B/A = 1.0

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (If observed, list morphological adaptations below).

Rapid test is met.

SOIL

Sampling Point: W-PFO-04

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/1	70	10YR 3/8	30	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-08

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-04_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S26 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): P 135A Lat: 33.3918553 Long: -88.5958254 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: PFO1A

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PFO-04. The area was a maintained pasture area. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PFO-04_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Schedonorus arundinaceus	65	✔	FAC
2. Schizachyrium scoparium	20	✔	FACU
3. Allium vineale	5		FACU
4. Ligustrum sinense	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95% = Total Cover		
50% of total cover: 48	20% of total cover: 19		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	95 (A)		310 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: W-PFO-04_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-05

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.382691 Long: -88.620830 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PFO-05. The APT showed normal conditions at the time leading up to and during the field survey

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PFO-05

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis laevigata	55	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	55% = Total Cover		
50% of total cover: 28	20% of total cover: 11		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Celtis laevigata	5	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
50% of total cover: 3	20% of total cover: 1		
Herb Stratum (Plot size: 5 ft r)			
1. Cyperus esculentus	5	✔	FAC
2. Elymus virginicus	5	✔	FAC
3. Packera glabella	5	✔	OBL
4. Trifolium repens	5	✔	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20% = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	60	x 2 =	120
FAC species	10	x 3 =	30
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	80 (A)		175 (B)

Prevalence Index = B/A = 2.19

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PFO-05

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	95	10YR 3/6	5	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soil indicator F6 is met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-05_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR or MLRA): P 135A Lat: 33.382359 Long: -88.621066 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Upland adjacent to W-PFO-05. The APT showed normal conditions at the time leading up to and during the field survey

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PFO-05_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis laevigata	35	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	35% = Total Cover		
50% of total cover: 18	20% of total cover: 7		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Juniperus virginiana	15	✔	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15% = Total Cover		
50% of total cover: 8	20% of total cover: 3		
Herb Stratum (Plot size: 5 ft r)			
1. Carex sp.*	45	✔	FAC
2. Ligustrum sinense	20	✔	FAC
3. Allium canadense	10		FACU
4. Smilax rotundifolia	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80% = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	70	x 3 =	210
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	130 (A)		380 (B)

Prevalence Index = B/A = 2.92

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. *The Carex could not be identified to species. It was assumed to be FAC since most species in the area are FAC or wetter.

SOIL

Sampling Point: W-PFO-05_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 16	10YR 3/2	100					Silty Clay	
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PFO-3_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 15

Subregion (LRR or MLRA): P 135A Lat: 33.385945 Long: -88.611650 Datum: NAD 83

Soil Map Unit Name: Vaiden silty clay, 2 to 5 percent slopes, eroded NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PFO-03. The APT showed normal conditions at the time leading up to and during the field survey

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PFO-3_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana	60	✔	FACU
2. Maclura pomifera	10		FACU
3. Cornus sp.	5		
4.			
5.			
6.			
7.			
8.			
	75%	= Total Cover	
50% of total cover: 38	20% of total cover: 15		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Carex sp.*	2	✔	FAC
2. Ligustrum sinense	2	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	4%	= Total Cover	
50% of total cover: 2	20% of total cover: 0.8		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	4	x 3 =	12
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	74 (A)		292 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. *The Carex could not be identified to species. It was assumed to be FAC since most species in the area are FAC or wetter.

SOIL

Sampling Point: W-PFO-3_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PSS-01

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): P 135A Lat: 33.382512 Long: -88.613860 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PSS-01. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 2	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PSS-01

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Fraxinus pennsylvanica	65	✔	FACW
2. Salix nigra	5		OBL
3.			
4.			
5.			
6.			
7.			
8.			
	70% = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon glomeratus	10	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10% = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	75	x 2 =	150
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		155 (B)

Prevalence Index = B/A = 1.94

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Rapid test is met.

SOIL

Sampling Point: W-PSS-01

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

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

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Soil sample was not taken due to inundation. Hydride soil is assumed due to prevalence of hydrophytic vegetation and wetland hydrology.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-11

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PSS-01_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): None Slope (%): 1

Subregion (LRR or MLRA): P 135A Lat: 33.382563 Long: -88.613821 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Upland sample plot adjacent to W-PSS-01. The sample plot was in a maintained/mowed area. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No ✔

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

Remarks:

No indicators are met.

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

Sampling Point: W-PSS-01_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft r)			
1. Cynodon dactylon	60	✔	FACU
2. Setaria pumila	30	✔	FAC
3. Cyperus esculentus	25		FAC
4. Erigeron canadensis	20		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	135% = Total Cover		
50% of total cover: 68	20% of total cover: 27		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	135 (A)		485 (B)

Prevalence Index = B/A = 3.59

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☐ No ✔

Remarks: (If observed, list morphological adaptations below).

No test is met.

SOIL

Sampling Point: W-PSS-01_UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/2	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-12

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PSS-02

Investigator(s): J. Brown, O. Haney Section, Township, Range: S33 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR or MLRA): P 135A Lat: 33.383865 Long: -88.628878 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: PFO1A

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

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

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

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

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

Remarks:

Sample plot in W-PSS-02. No upland sample plot was taken. Boundary was determined by significant topographical change. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 6	
Water Table Present?	Yes ✔	No _____	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0	**Wetland Hydrology Present?** Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-PSS-02

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	50	✔	FACW
2. Gleditsia aquatica	5		OBL
3.			
4.			
5.			
6.			
7.			
8.			
	55%	= Total Cover	

50% of total cover: 28 20% of total cover: 11

Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft r)			
1. Rumex crispus	2	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	2%	= Total Cover	

50% of total cover: 1 20% of total cover: 0

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	50	x 2 =	100
FAC species	2	x 3 =	6
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	57 (A)		111 (B)

Prevalence Index = B/A = 1.95

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PSS-02

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No sample taken. Soil was inundated.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PSS/PFO-01

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 135A Lat: 33.383971 Long: -88.603066 Datum: NAD 83

Soil Map Unit Name: Catalpa silty clay NWI classification: NA

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

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

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

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

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

Remarks:

Sample plot in W-PSS/PFO-01. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

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

Remarks:

Wetland hydrology indicators are met.

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

Sampling Point: W-PSS/PFO-01

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	70	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	70% = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Fraxinus pennsylvanica	50	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	50% = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Herb Stratum (Plot size: 5 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	120	x 2 =	240
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		240 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No

Remarks: (If observed, list morphological adaptations below).

Rapid test is met.

SOIL

Sampling Point: W-PSS/PFO-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 2/1	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

Indications of redox are most likely masked due to the extremely dark and saturated nature of the soil. Hydro soil is assumed due to the prevalence of hydrophytic vegetation and wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Golden Triangle Phase 2 City/County: Lowndes County Sampling Date: 2021-03-10

Applicant/Owner: TVA State: Mississippi Sampling Point: W-PSS/PFO-01_UPL

Investigator(s): J. Brown, O. Haney Section, Township, Range: S34 T18N R16E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 10

Subregion (LRR or MLRA): P 135A Lat: 33.383022 Long: -88.605213 Datum: NAD 83

Soil Map Unit Name: PFO1A NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland sample plot adjacent to W-PSS/PFO-01. The APT showed normal conditions at the time leading up to and during the field survey.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-PSS/PFO-01_UPL

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana	40	✔	FACU
2. Maclura pomifera	40	✔	FACU
3. Ulmus americana	20	✔	FAC
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Juniperus virginiana	40	✔	FACU
2. Ulmus americana	15	✔	FAC
3. Cornus florida	10		FACU
4.			
5.			
6.			
7.			
8.			
	65% = Total Cover		
50% of total cover: 33	20% of total cover: 13		
Herb Stratum (Plot size: 5 ft r)			
1. Ligustrum sinense	40	✔	FAC
2. Carex sp.*	20	✔	FAC
3. Viola sororia	15	✔	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75% = Total Cover		
50% of total cover: 38	20% of total cover: 15		
Woody Vine Stratum (Plot size: 30 ft r)			
1. Smilax rotundifolia	10	✔	FAC
2. Lonicera japonica	5	✔	FACU
3.			
4.			
5.			
	15% = Total Cover		
50% of total cover: 8	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	120	x 3 =	360
FACU species	135	x 4 =	540
UPL species	0	x 5 =	0
Column Totals:	255 (A)		900 (B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks: (If observed, list morphological adaptations below).

Dominance test is met.

SOIL

Sampling Point: W-PSS/PFO-01_UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 2/1	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

No indicators are met.

APPENDIX E – TVA RAPID ASSESSMENT METHOD (RAM) FIELD FORM

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-001	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | 2 subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | 1 subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | 13 subtotal

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | 6 subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

21

Site: PUB-001	**Rater(s):** OH:jb	**Date:** 03/2021

21
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☒ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☒ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

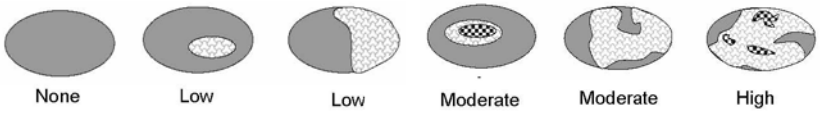
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

22 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-002	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | 2 subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | 1 subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | 13 subtotal

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | 6 subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

21

Site: PUB-002	**Rater(s):** OH:jb	**Date:** 03/2021

21
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☒ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☒ None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

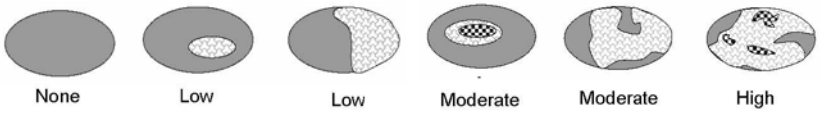
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

22 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-003	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | 2 subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | 1 subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | 13 subtotal

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | 6 subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

22

Site: PUB-001	**Rater(s):** OH:jb	**Date:** 03/2021

22
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

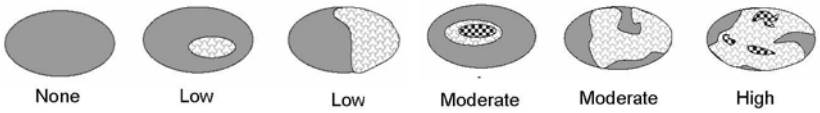
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-004	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [X] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [X] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 17

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [X] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [X] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [X] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [ ] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [☑] other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [☑] mowing
- [☑] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [☑] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [☑] nutrient enrichment

26

Site: PUB-004	**Rater(s):** OH:jb	**Date:** 03/2021

26
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

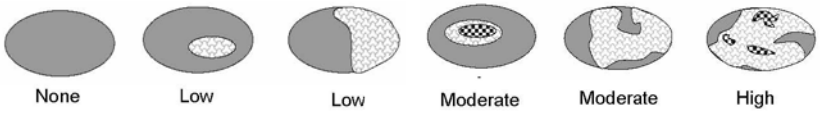
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

27 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-005	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

	2
max 6 pts.	subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

	1
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

	17
max 30 pts.	subtotal

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☒ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

	6
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

26

Site: PUB-005	**Rater(s):** OH:jb	**Date:** 03/2021

26
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

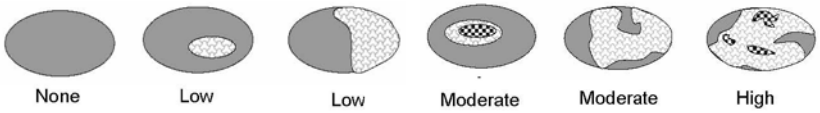
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

27 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-006	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 13

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

22

Site: PUB-006	**Rater(s):** OH:jb	**Date:** 03/2021

22
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☒ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☒ None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

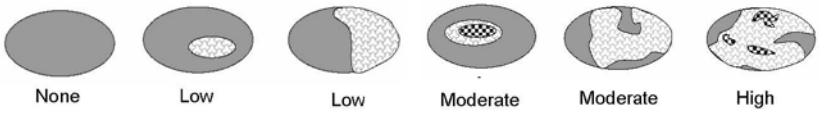
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-007	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 13

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

22

Site: PUB-007	**Rater(s):** OH:jb	**Date:** 03/2021

22
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

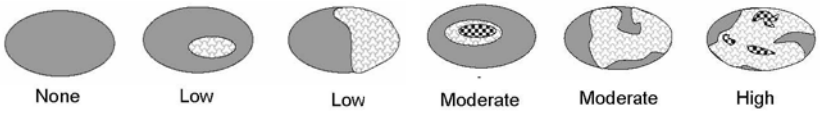
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-008	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | 2 subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | 1 subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | 13 subtotal

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | 6 subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

22

Site: PUB-008	**Rater(s):** OH:jb	**Date:** 03/2021

22
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

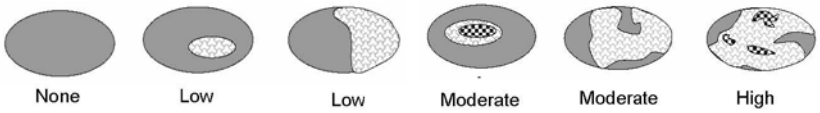
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-009	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

2 (max 6 pts. / subtotal)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

9 (max 14 pts. / subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☒ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

13 (max 30 pts. / subtotal)

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

6 (max 20 pts. / subtotal)

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

30

Site: PUB-001	**Rater(s):** OH:jb	**Date:** 03/2021

21
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

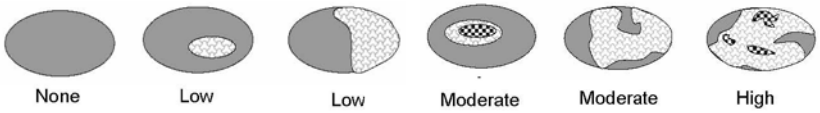
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

31 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-010	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 13

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

22

Site: PUB-010	**Rater(s):** OH:jb	**Date:** 03/2021

22
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

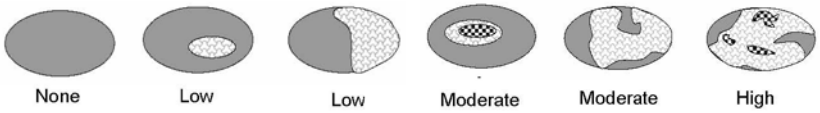
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-011	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | 1 subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☒ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | 1 subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | 13 subtotal

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | 6 subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

21

Site: PUB-011	**Rater(s):** OH:jb	**Date:** 03/2021

21
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☒ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☒ None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

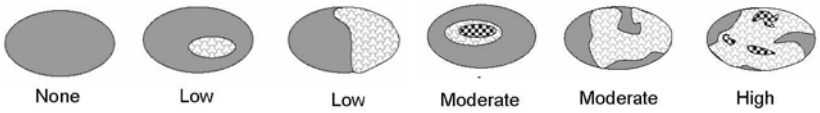
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

22 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-012	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 13

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other _____

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

21

Site: PUB-012	**Rater(s):** OH:jb	**Date:** 03/2021

21
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

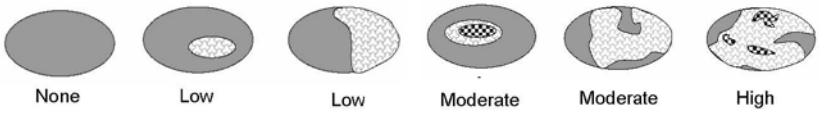
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

22 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-013	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 12

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 17

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☒ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other _____

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

37

Site: PUB-013	**Rater(s):** OH:jb	**Date:** 03/2021

37
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

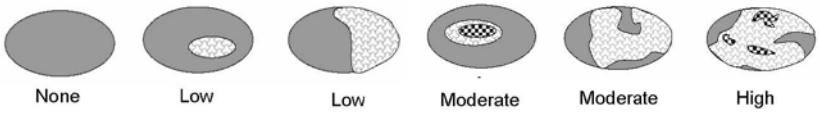
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

38 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-014	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 17

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☒ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other _____

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

26

Site: PUB-014	**Rater(s):** OH:jb	**Date:** 03/2021

26
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

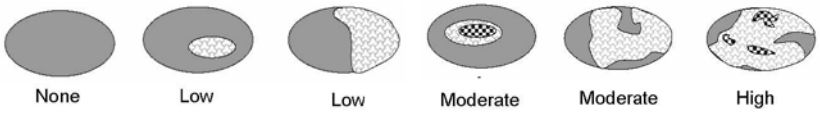
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

27 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-015	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

0 (max 6 pts. / subtotal)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☒ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

12 (max 14 pts. / subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

13 (max 30 pts. / subtotal)

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

6 (max 20 pts. / subtotal)

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

31

Site: PUB-015	**Rater(s):** OH:jb	**Date:** 03/2021

31
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

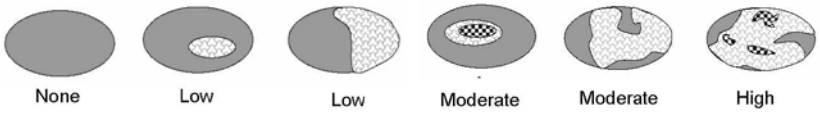
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

32 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-016	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

0 (max 6 pts. / subtotal)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [X] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

12 (max 14 pts. / subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [X] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [X] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

13 (max 30 pts. / subtotal)

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [X] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [X] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [ ] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [☑] other cattle grazing

Metric 4. Habitat Alteration and Development

6 (max 20 pts. / subtotal)

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [☑] mowing
- [☑] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [☑] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [☑] nutrient enrichment

31

Site: PUB-016	**Rater(s):** OH:jb	**Date:** 03/2021

31
subtotal previous page

max 10 pts. | subtotal

raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

max 20 pts. | 1 subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

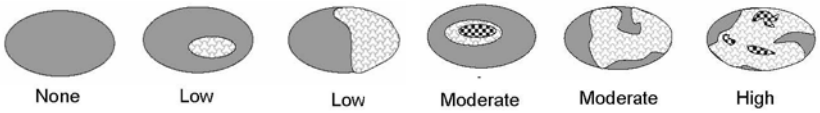
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

32

GRAND TOTAL (max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-017	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 0

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☒ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 3

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 13

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

22

Site: PUB-017	**Rater(s):** OH:jb	**Date:** 03/2021

22
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☒ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☒ None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

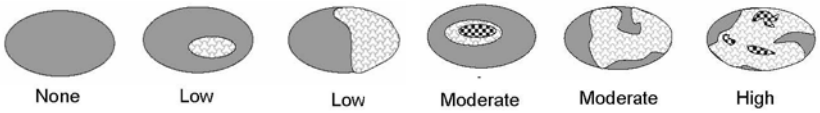
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-018	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☒ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 13

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

22

Site: PUB-018	**Rater(s):** OH:jb	**Date:** 03/2021

21
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

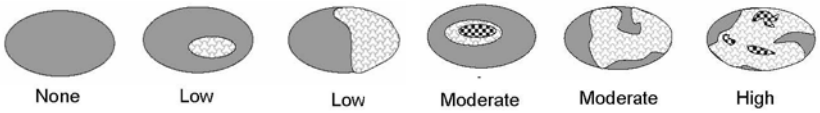
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHORITY RAPID ASSESSMENT METHOD: Assessing Wetland Condition, Functional Capacity, and Quality
TVARAM FIELD FORM

Site: PUB-019	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

2 (max 6 pts. / subtotal)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

2 (max 14 pts. / subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☒ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

13 (max 30 pts. / subtotal)

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other cattle grazing

Metric 4. Habitat Alteration and Development

6 (max 20 pts. / subtotal)

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

23

Site: PUB-019	**Rater(s):** OH:jb	**Date:** 03/2021

23
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

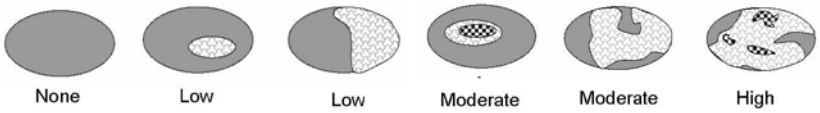
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

24 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: PUB-020	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [X] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [X] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 21

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [X] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [X] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g., forest), complex (1)
- [X] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [X] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [ ] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other _____

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] mowing
- [x] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [x] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [x] nutrient enrichment

30

Site: PUB-020	**Rater(s):** OH:jb	**Date:** 03/2021

30
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [X] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [X] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

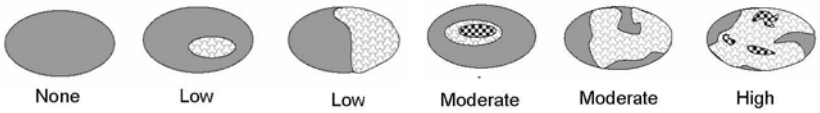
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

31

GRAND TOTAL (max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-01	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 0

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☒ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 5

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☒ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

12

Site: W-PEM-1	**Rater(s):** OH:jb	**Date:** 03/2021

12
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

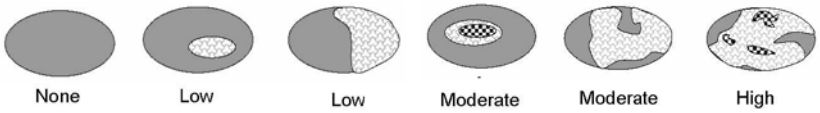
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

13 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-02	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 1

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☒ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 12

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☒ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

☐ ditch	☐ point source (nonstormwater)
☐ tile (including culvert)	☐ filling/grading
☐ dike	☑ road bed/RR track
☐ weir	☐ dredging
☐ stormwater input	☑ other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

☑ mowing	☐ shrub/sapling removal
☑ grazing	☐ herbaceous/aquatic bed removal
☐ clearcutting	☐ woody debris removal
☐ selective cutting	☐ sedimentation
☐ farming	☐ dredging
☐ toxic pollutants	☑ nutrient enrichment

19

Site: W-PEM-2	**Rater(s):** OH:jb	**Date:** 03/2021

19
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

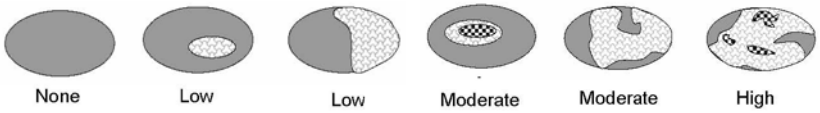
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

20 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-03	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

0 (max 6 pts. / subtotal)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [X] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

1 (max 14 pts. / subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [X] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

12 (max 30 pts. / subtotal)

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [X] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [X] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [☑] other mowing

Metric 4. Habitat Alteration and Development

6 (max 20 pts. / subtotal)

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [☑] mowing
- [☑] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [☑] nutrient enrichment

18

Site: W-PEM-3	**Rater(s):** OH:jb	**Date:** 03/2021

18
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

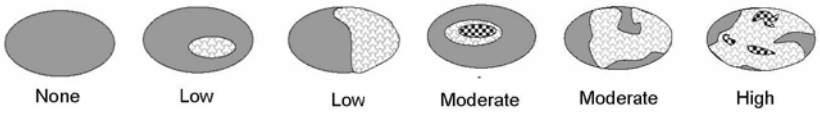
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

19 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-04	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 1 2

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☒ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

18

Site: W-PEM-4	**Rater(s):** OH:jb	**Date:** 03/2021

18
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

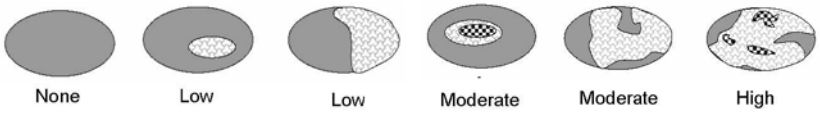
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

19 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-05	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 11

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☒ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☒ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

20

Site: W-PEM-05	**Rater(s):** OH:jb	**Date:** 03/2021

20
subtotal previous page

max 10 pts. | subtotal

raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

max 20 pts. | 1 subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☒ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☒ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☒ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

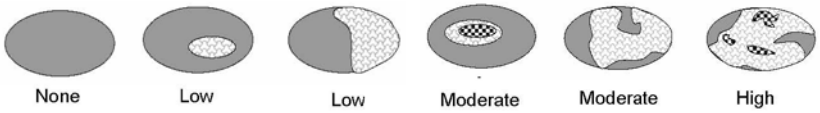
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

21

GRAND TOTAL (max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-06	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 1

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [X] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [X] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 12

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [ ] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [X] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [X] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [☑] other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 3

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [☑] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

17

Site: W-PEM-06	**Rater(s):** OH:jb	**Date:** 03/2021

17
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

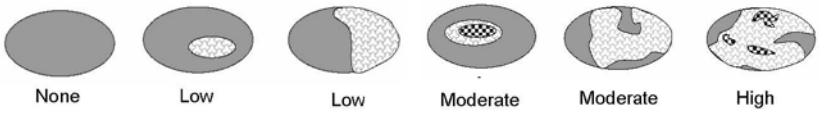
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

18 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-07	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [X] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [X] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 5

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [X] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [X] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [☑] other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [☑] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [☑] nutrient enrichment

14

Site: W-PEM-07	**Rater(s):** OH:jb	**Date:** 03/2021

14
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

1
max 20 pts. | subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

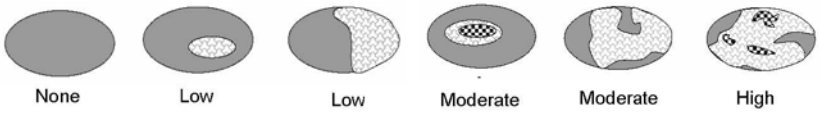
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

15
GRAND TOTAL (max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-08	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | 3 subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☒ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | 1 subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | 7 subtotal

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | 6 subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

17

Site: W-PEM-08	**Rater(s):** OH:jb	**Date:** 03/2021

17
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

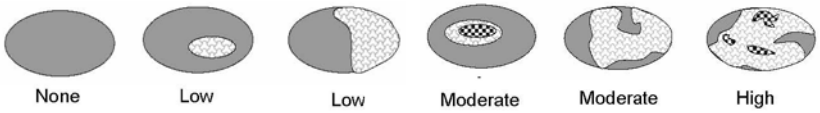
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

18 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PEM-10	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 12

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☒ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☑ mowing
- ☑ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

21

Site: W-PEM-10	**Rater(s):** OH:jb	**Date:** 03/2021

21
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 1 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [X] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [X] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

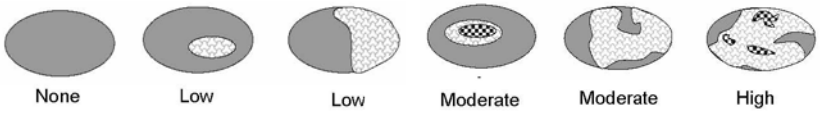
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

22 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PFO-01	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 1

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [X] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 3

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 4

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [X] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [X] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [☑] other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [☑] mowing
- [☑] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [☑] nutrient enrichment

14

Site: W-PFO-01	**Rater(s):** OH:jb	**Date:** 03/2021

14
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 3 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [X] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [X] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

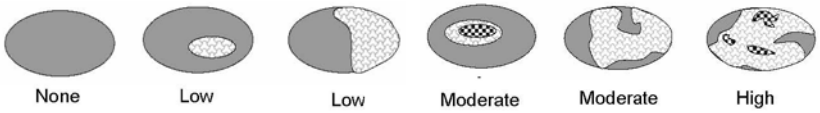
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

17 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PFO-02	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [X] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [X] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 8

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [X] Other groundwater (3) [BR/CM (5)]
- [ ] Precipitation (1) [unless BR/CM primary source (5)]
- [X] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [X] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [X] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 6

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [x] nutrient enrichment

17

Site: W-PFO-04	**Rater(s):** OH:jb	**Date:** 03/2021

17
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | 1 subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 3 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☒ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☒ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☒ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

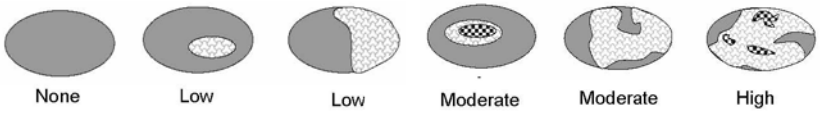
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

21 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PFO-03	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

0 (max 6 pts. / subtotal)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☒ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

11 (max 14 pts. / subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☒ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☒ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

10 (max 30 pts. / subtotal)

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3) [BR/CM (5)]
- ☐ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☒ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other mowing

Metric 4. Habitat Alteration and Development

41 (max 20 pts. / subtotal)

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☒ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☒ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

41

Site: W-PFO-04	**Rater(s):** OH:jb	**Date:** 03/2021

41
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

max 20 pts. | 6 subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [X] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [X] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [X] Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

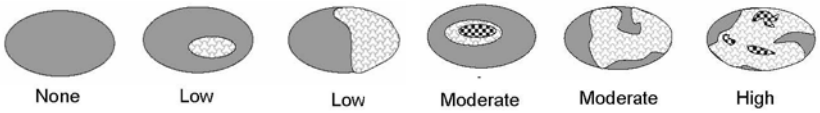
Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

47 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PFO-04	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 1

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [X] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 4

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 27

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [X] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [X] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [X] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [X] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 16

4a. Substrate disturbance. Score one or double check and average.

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [X] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

47

Site: W-PFO-04	**Rater(s):** OH:jb	**Date:** 03/2021

47
subtotal previous page

max 10 pts. | -10 subtotal

raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [X] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

max 20 pts. | 1 subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [X] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [X] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

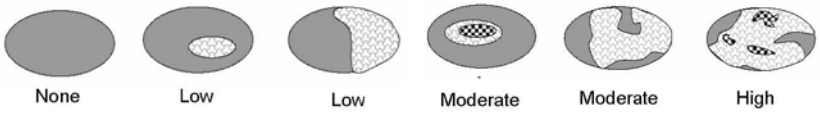
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

37

GRAND TOTAL (max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PFO-05	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [X] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 4

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 10

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [X] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [X] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [X] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [☑] other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 11

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [X] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [X] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [☑] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [☑] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [☑] nutrient enrichment

25

Site: W-PFO-05	**Rater(s):** OH:jb	**Date:** 03/2021

25
subtotal previous page

max 10 pts. | subtotal

raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

max 20 pts. | 3 subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☒ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☒ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

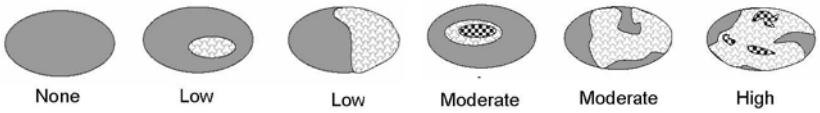
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

30 **GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: W-PFO-06	**Rater(s):** JB; OH	**Date:** 03/2021

Metric 1. Wetland Area (size)

max 6 pts. | subtotal: 2

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GPS

Metric 2. Upland Buffers and Surrounding Land Use

max 14 pts. | subtotal: 4

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☒ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☒ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

max 30 pts. | subtotal: 7

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☒ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☒ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☒ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other mowing

Metric 4. Habitat Alteration and Development

max 20 pts. | subtotal: 7

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☒ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

20

Site: W-PFO-06	**Rater(s):** OH:jb	**Date:** 03/2021

20
subtotal previous page

Metric 5. Special Wetlands

max 10 pts. | subtotal

raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

3
max 20 pts. | subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [X] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [X] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

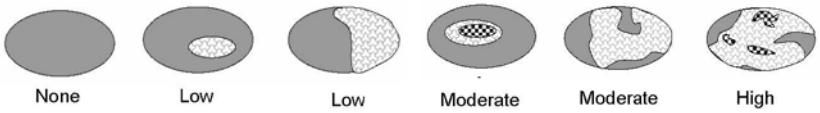
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23
GRAND TOTAL (max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

BURNS McDONNELL

CREATE AMAZING.

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com

APPENDIX C
ONSITE AND OFFSITE DRAINAGE REPORT

ONSITE AND OFFSITE DRAINAGE REPORT

Golden Triangle Solar Project Phase 2

Lowndes County, Mississippi

PREPARED FOR

MS Solar 6, LLC
800 Brickell Ave, Suite 1100
Miami, Florida 33131
Contact: Daniel Ferrell
Director of Project Development
Origis Energy USA
(786) 757 4332

PREPARED BY

421 Fayetteville St., Suite 600
Raleigh, NC 27601
Contact: John Barefoot
(919) 653-5843
June 2021

TABLE OF CONTENTS

1 INTRODUCTION 2
1.1 Project Background 2
1.2 Site Description 2
2 ENGINEERING METHODOLOGY 2
2.1 Model Selection 3
2.2 Model Topography and Extents 3
2.3 Soil Data 3
2.4 Precipitation 3
2.5 Hydrologic Analysis 3
2.6 Hydraulic Analysis 4
2.7 Inundation Depth Calculation Summary 4
2.8 Velocity Calculation Summary 4
2.9 Scour Depth Calculation Summary 4
3 CONCLUSIONS 5
4 REFERENCES 6

LIST OF FIGURES

Figure 1. Site Location Map
Figure 2. Topographic Work Map
Figure 3. HEC-RAS Study Map
Figure 4. Pre-Development 100-Year Depth Map
Figure 5. Pre-Development 100-Year Flow Velocity Map
Figure 6. Pre-Development 100-Year Scour Depth Map
Figure 7. USGS Quadrangle Map
Figure 8. FEMA FIRM Map
Figure 9. NRCS WSS Site Soil Map

LIST OF APPENDICES

Appendix A. Figures

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Kimley-Horn was retained by MS Solar 6, LLC to conduct a hydrologic analysis for the proposed solar photovoltaic (PV) generation facility Golden Triangle Solar in Lowndes County, Mississippi (Figure 1). The project site is located approximately 10 miles east of the city of Starkville, Mississippi and 2 miles west of Golden Triangle Regional Airport. This report summarizes the results of the Phase 2 existing conditions drainage analysis in and around the project site. The drainage analysis estimates the existing conditions 100-year inundation depths, flow velocities, and scour depths in and around the project site.

1.2 SITE DESCRIPTION

The project site is approximately 1,835 acres located in Lowndes County, Mississippi east of Catalpa Creek. It is bounded by Artesia Road to the north and Swedenburg Road to the south. The existing site land cover consists primarily of pasture, agricultural land, wetlands, and forest.

The latest USGS Quad Map (Figure 7) shows a perennial stream, Gilmer Creek, to the north of the site. North Branch Magowah Creek passes through the southern section of the site, and there are also numerous intermittent streams located within the site that are shown as dashed blue lines.

The project site is located within **FEMA FIRM Panels 28087C0225K and 28087C0250K** (Figure 8). **FEMA unshaded Zone X** contains areas determined to be outside the 0.2% (500-year) annual chance floodplain. **FEMA Zone A** contains areas determined by FEMA to be inside the 1% annual chance special flood hazard area via Approximate or Limited Detail methods. **FEMA Zone AE** contains areas determined to be in the 1% annual chance special flood hazard area via Detailed methods, with provided base flood elevations. **FEMA Zone AE Floodway** is the portion of the floodplain reserved for the passage of the base flood.

Most of the site lies within **FEMA unshaded Zone X.** The southern portion of the site lies within **FEMA Zone A** associated with North Branch Magowah Creek.

The existing topography is generally moderately sloped with some steep areas. The slope ranges from 0 to 10 percent within most of the site, with slopes over 10 percent located along ridges and steeper channel banks. The majority of the site has less than a 3 percent slope. The elevation ranges from 205 to 280 feet, with the northern portion of the site draining to the west, while the rest of the site drains to North Branch Magowah Creek to the south and east.

Kimley-Horn received survey of specific hydraulic structures within and adjacent to the project site from Survey and Mapping, LLC (SAM) on April 29th, 2021. A total of 26 culverts were confirmed and measured during the site visit.

2 ENGINEERING METHODOLOGY

The project site is at risk from onsite flooding due to extreme onsite precipitation events. This analysis modeled an extreme 100-year precipitation event occurring over the onsite area, and adjacent offsite area. This methodology captures the initial flooding resulting from onsite and immediate offsite precipitation and subsequent runoff.

2.1 MODEL SELECTION

The topography within the project site creates drainage patterns that vary in direction across the land surface outside of defined channels. 2-dimensional (2-D) hydrodynamic models are ideal for modeling the runoff and drainage patterns of flat areas without strong one-dimensional channel definition. The modeling in this analysis utilizes the 2-D version of the U.S Army Corps of Engineers' Hydrologic Center River Analysis System (HEC-RAS) version 5.0.7.

2.2 MODEL TOPOGRAPHY AND EXTENTS

The model topography is derived from LiDAR elevation data obtained from the Mississippi Automated Resource Information System website combined with onsite survey topographic data (Figure 2). All mapping was done using vertical datum NAVD 88. Onsite topography was used to define the onsite 2-D modeling boundary just beyond the estimated runoff boundary to allow the model to calculate the direction of runoff (Figure 3).

2.3 SOIL DATA

The soil data obtained from the NRCS Web Soil Survey indicates the site is composed mostly of silty clay and silty clay loam with assigned Hydrologic Soil Groups C, D, and C/D (Figure 9). Due to the extreme nature of the modeled 100-year rainfall event and the resulting inundation conditions that follow, soils with dual classification are assumed to be undrained and are modeled as group D. Assuming that the soils are undrained in the modeled scenario produces conservative runoff volumes and inundation depths.

2.4 PRECIPITATION

The precipitation depth for the 24-hour, 1-percent (100-year) annual chance event was obtained from the NOAA Atlas 14 Precipitation-Frequency Estimates. The rainfall distribution hyetograph utilized for onsite hydrology modeling was created by distributing the 24-hour rainfall total over the SCS Type II synthetic rainfall distribution curve. The SCS Type II distribution was selected based on geographic boundaries for SCS rainfall distributions provided in Appendix B of the USDA's Technical Release 55.

2.5 HYDROLOGIC ANALYSIS

Onsite hydrology was simulated as excess rainfall runoff applied directly to the onsite 2-D modeling area. The total 24-hour rainfall depth for the 100-year annual chance event is 9.45 inches. Kimley-Horn used the USACE's Hydrologic Modeling System software (HEC-HMS) version 4.7 to produce a timeseries of the precipitation excess from the rainfall distribution hyetograph. The precipitation excess timeseries is the amount of rainfall that is converted to runoff after subtracting the rainfall captured in microtopography on the surface and losses due to infiltration. Kimley-Horn used the Soil Conservation Service (SCS) curve number loss method within HEC-HMS to calculate the losses over the 2-D modeling area based on land cover and soil data. National Land Cover Database (NLCD) 2016 data and aerial imagery were used to delineate the existing land cover within the 2-D modeling area. The resulting precipitation excess timeseries was applied equally across the 2-D modeling area.

2.6 HYDRAULIC ANALYSIS

In HEC-RAS, the 2-D modeling boundary was divided into a 2-D computational grid with a maximum cell size of 100-feet (Figure 3).The combined LiDAR and onsite topographic survey model terrain surface was used to develop a family of rating tables for the stage storage volume in each computational grid cell. HEC-RAS defines cross sections at each cell face of the computational grid to more accurately simulate flow between cells.

The computational grid was further refined by adding breaklines to subdivide cells along important hydraulic features such as channels, culverts, roads, and berms (Figure 3). The minimum computational grid cell size along breaklines is 4 feet.

Culvert measurements received from survey and remote observation were incorporated into the 2-D hydraulic model. Survey information and professional judgement were used to assign Manning's n, entrance loss, and exit loss values during the modeling process. Aerial imagery and LiDAR were referenced to assign culvert lengths and invert elevations.

Roughness coefficients were applied to the grid to account for energy losses to water flow due to friction based on existing landcover data.

Outflow boundary conditions for the model were defined at the boundary of the 2-D computational grid. The boundary condition type was set to normal depth and assigned a friction slope ranging from 0.5 to 2.5 percent.

2.7 INUNDATION DEPTH CALCULATION SUMMARY

Predicted inundation depths for existing conditions are calculated based on the 2-D modeling simulation and are mapped within the study area. Results are shown in Figure 4. The mapping reflects depths that are expected to equal or exceed 0.25 feet. The direct rainfall method produces depth in every grid cell of the mesh. Shallower depths are removed from the mapping as is typically done for models based on the direct rainfall method.

The inundation depths on the project parcels range from 0 to 13 feet, with the greatest depths occurring within North Branch Magowah Creek. The regions with over 2 feet of expected depth are mostly restricted to channels, established FEMA flood zones, or areas that are impounded by a downstream change in elevation.

2.8 VELOCITY CALCULATION SUMMARY

Predicted flow velocities were examined in the HEC-RAS model with results shown in Figure 5. Flow velocities that are shown to be greater than 1 foot per second are associated with defined flow paths and their associated overflow areas.

2.9 SCOUR DEPTH CALCULATION SUMMARY

Pier scour depth is calculated within the project parcels using guidance in *HEC-18: Evaluating Scour at Bridges, Fifth Edition* (FHWA, 2012). The calculated pier scour depth is based on the modeled maximum flow velocity and maximum flow depth. While the flow depth and flow velocity may not reach their maximum levels at the same time and location, this assumption produces a conservative estimate of scour for the entire site. The model indicates portions of the site will experience potential scour depths in excess of 1 foot, generally along defined flow paths (channels and draws). Anticipated scour depths within the project parcels are shown in Figure 6.

3 CONCLUSIONS

The inundation depths generally range from 0 to 13 feet in most areas onsite. The deepest inundation is shown within the southernmost parcels and is associated with depths within the channel of North Branch Magowah Creek. Areas of inundation within the other parcels are generally associated with existing onsite channels and local depression ponding.

Recommendations:

- Based on this analysis, we recommend avoiding array development within areas of higher inundation depth, flow velocity, and scour, particularly within FEMA Zone A (Figures 4 and 8).
- Based on this analysis, we recommend final system design consider placing equipment outside of areas with inundation depths exceeding 1 foot or provide countermeasures. Countermeasures may include extending posts to elevate equipment, installing additional culverts to provide inundation relief, or grading modifications to eliminate local depressions where ponding may occur.
- Based on this analysis, we recommend final system design consider placing equipment outside of areas with probable scour depths exceeding 1 foot or provide countermeasures. Countermeasures may include extending posts deeper, applying erosion control matting, or grading to smooth out local areas with a high slope.

4 REFERENCES

Chow, V.T., 1959. Open Channel Hydraulics. McGraw-Hill, New York.

Cook, L.M. and McCuen, R.H. (2013). Hydrologic Response of Solar Impacts. Journal of Hydrologic Engineering, 18(5), 536-541. http://ascelibrary.org/doi/abs/10.1061/%28ASCE%29HE.1943-5584.0000530?journalCode=jhyeff&

Folmar, N.D., and A.C. Miller. 2008. Development of an empirical lag time equation. Amer. Soc. of Civil Eng. Journal of Irrigation and Drainage, Vol. 134, No. 4. https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=27002.wba

NOAA Atlas 14, Point Precipitation Frequency (PF) Data Server.. https://hdsc.nws.noaa.gov/hdsc/pfds/

U.S. Army Corps of Engineers (USACE, 2016). 2016. CPD-68: HEC-RAS River Analysis System User's Manual http://www.hec.usace.army.mil/software/hec-ras/documentation/HEC-RAS%205.0%20Users%20Manual.pdf

U.S. Army Corps of Engineers (USACE, 2016). 2016. CPD-68A: HEC-RAS River Analysis System 2D Modeling User's Manual http://www.hec.usace.army.mil/software/hec-ras/documentation/HEC-RAS%205.0%202D%20Modeling%20Users%20Manual.pdf

U.S. Army Corps of Engineers (USACE, 2016). 2016. CPD-70: HEC-RAS River Analysis System Application Guide http://www.hec.usace.army.mil/software/hec-ras/documentation/HEC-RAS%205.0%20Applications%20Guide.pdf

U.S. Army Corps of Engineers (USACE, 2018). 2018. CPD-74A: Hydrologic Modeling System HEC-HMS User's Manual https://www.hec.usace.army.mil/software/hec-hms/documentation/HEC-HMS_Users_Manual_4.3.pdf

U.S. Department of Agriculture (USDA, 1986). 1986. TR-55: Urban Hydrology for Small Watersheds https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf

U.S. Department of Agriculture, Natural Resources Conservation Service. Part 654 Stream Restoration Design National Engineering Handbook. Chapter 8, Threshold Channel Design. August 2007.

U.S. Department of Agriculture, Natural Resources Conservation Service. Part 630 Hydrology National Engineering Handbook Chapter 15, Time of Concentration. May 2010. https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=27002.wba

U.S. Department of Transportation. Federal Highway Administration (2012). Evaluating Scour at Bridges Fifth Edition (Publication No. FHWA-HIF-12-003) https://www.fhwa.dot.gov/engineering/hydraulics/pubs/hif12003.pdf

Yang, L., Jin, S., Danielson, P., Homer, C.G., Gass, L., Bender, S.M., Case, A., Costello, C., Dewitz, J.A., Fry, J.A., Funk, M., Granneman, B.J., Liknes, G.C., Rigge,

M.B., and Xian, G., 2018, A new generation of the United States National Land Cover Database—Requirements, research priorities, design, and implementation strategies: ISPRS Journal of Photogrammetry and Remote Sensing, v. 146, p. 108–123, at https://doi.org/10.1016/j.isprsjprs.2018.09.006.

Appendix A – Figures

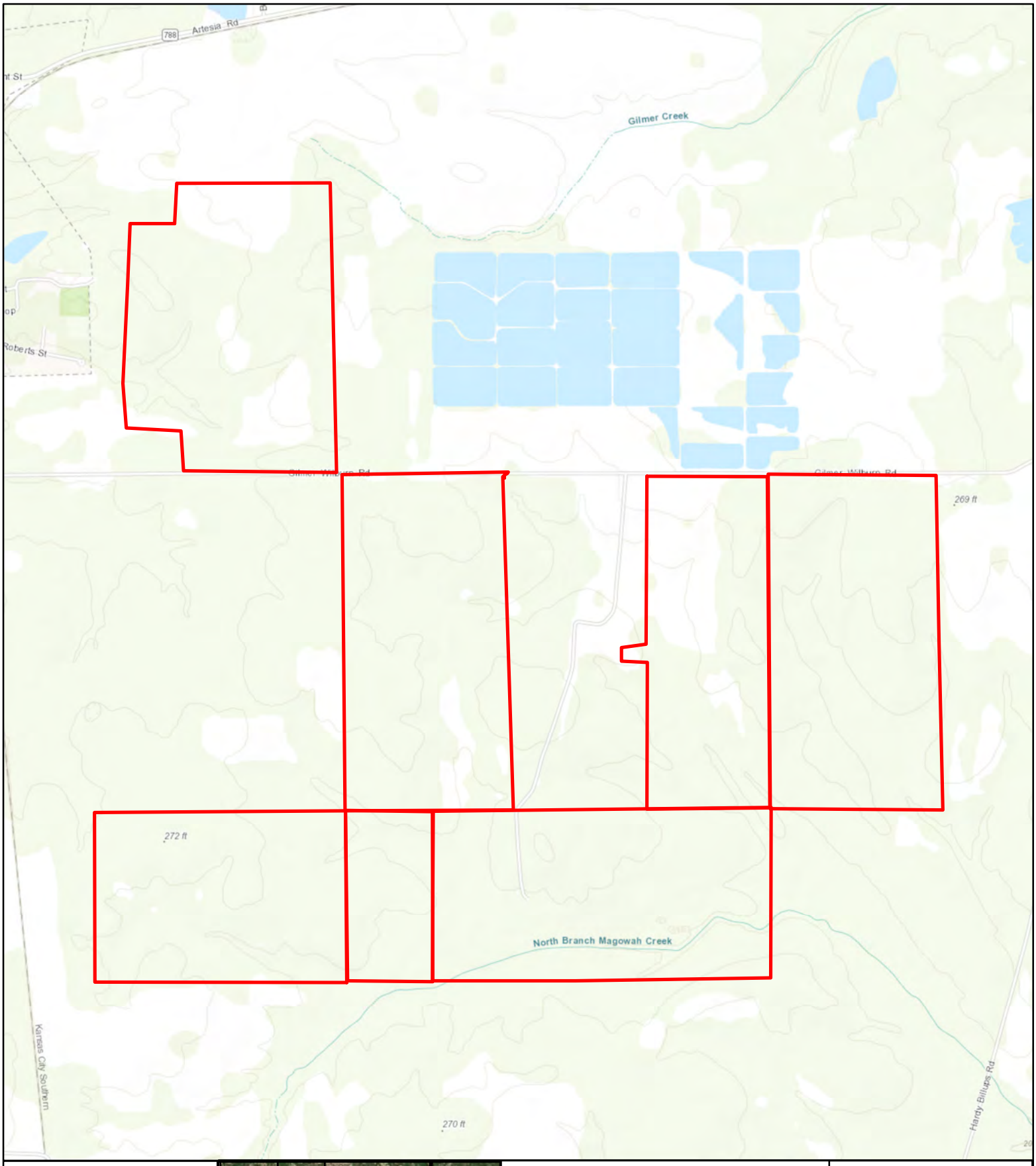


Figure 1
Site Location Map

Golden Triangle Solar Phase 2
prepared for
MS Solar 6, LLC

Lowndes County Mississippi



Legend

Project Area

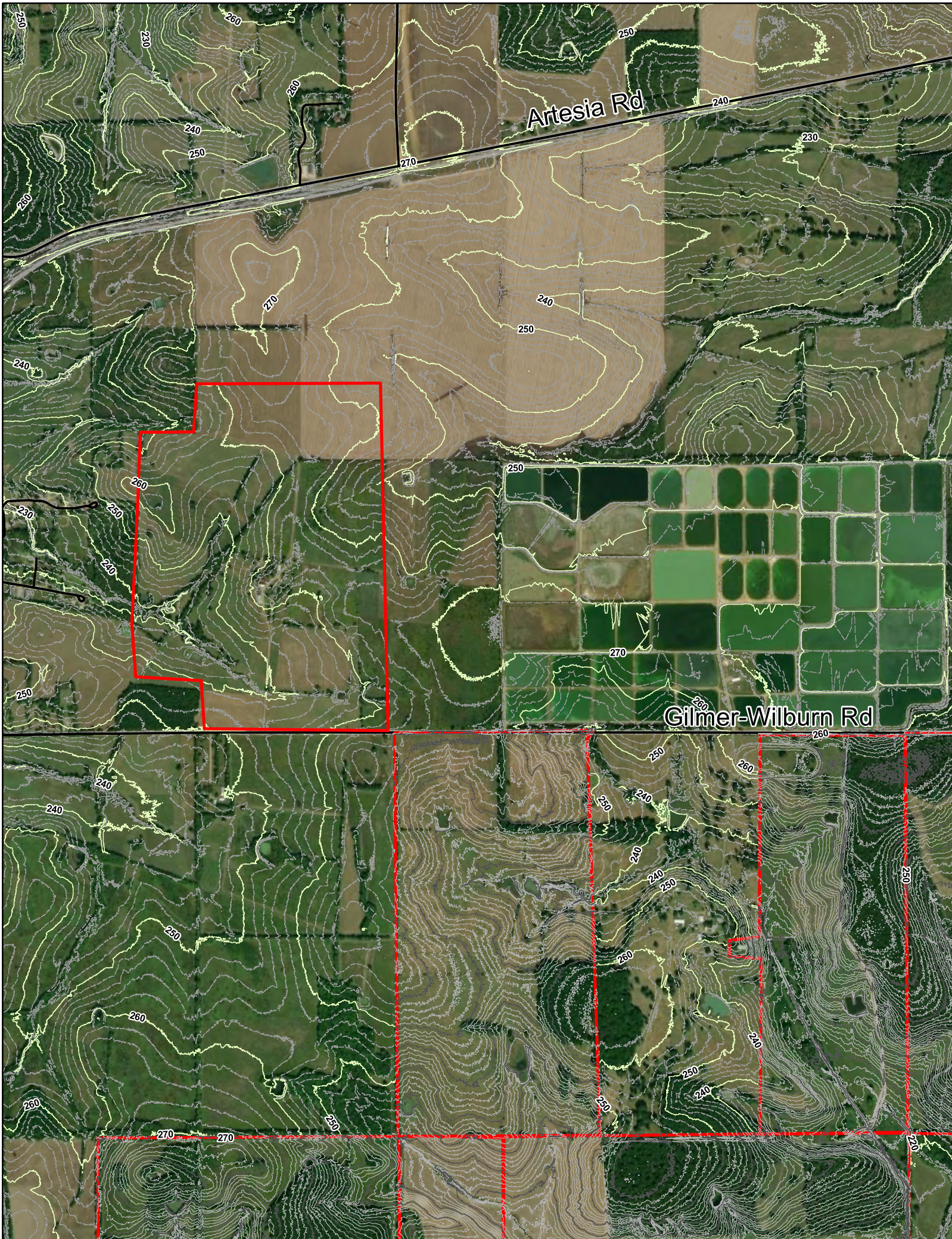
N

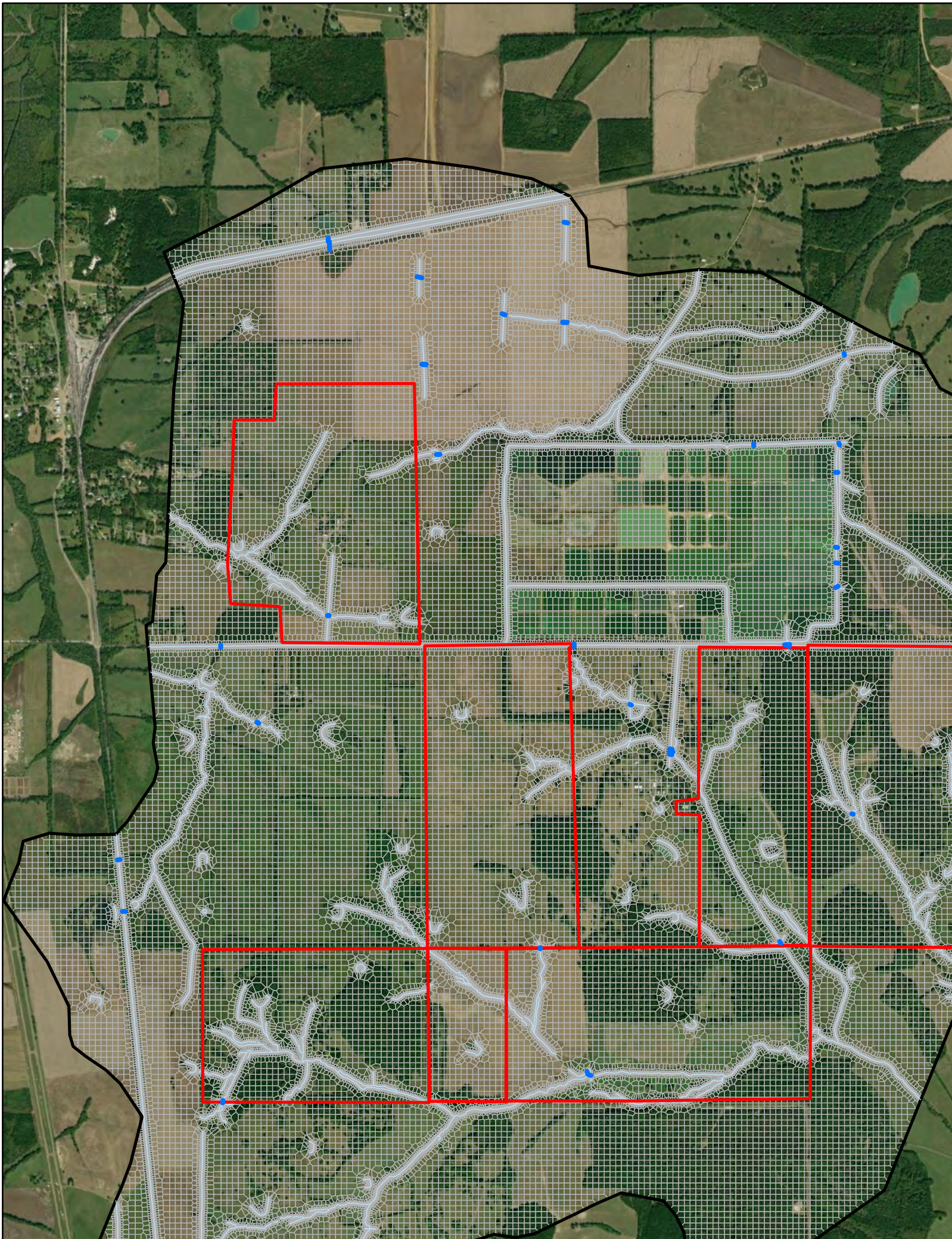
0 1,000 2,000
Feet

PREPARED BY

Kimley»Horn

June 2021


Artesia Rd
Gilmer-Wilburn Rd









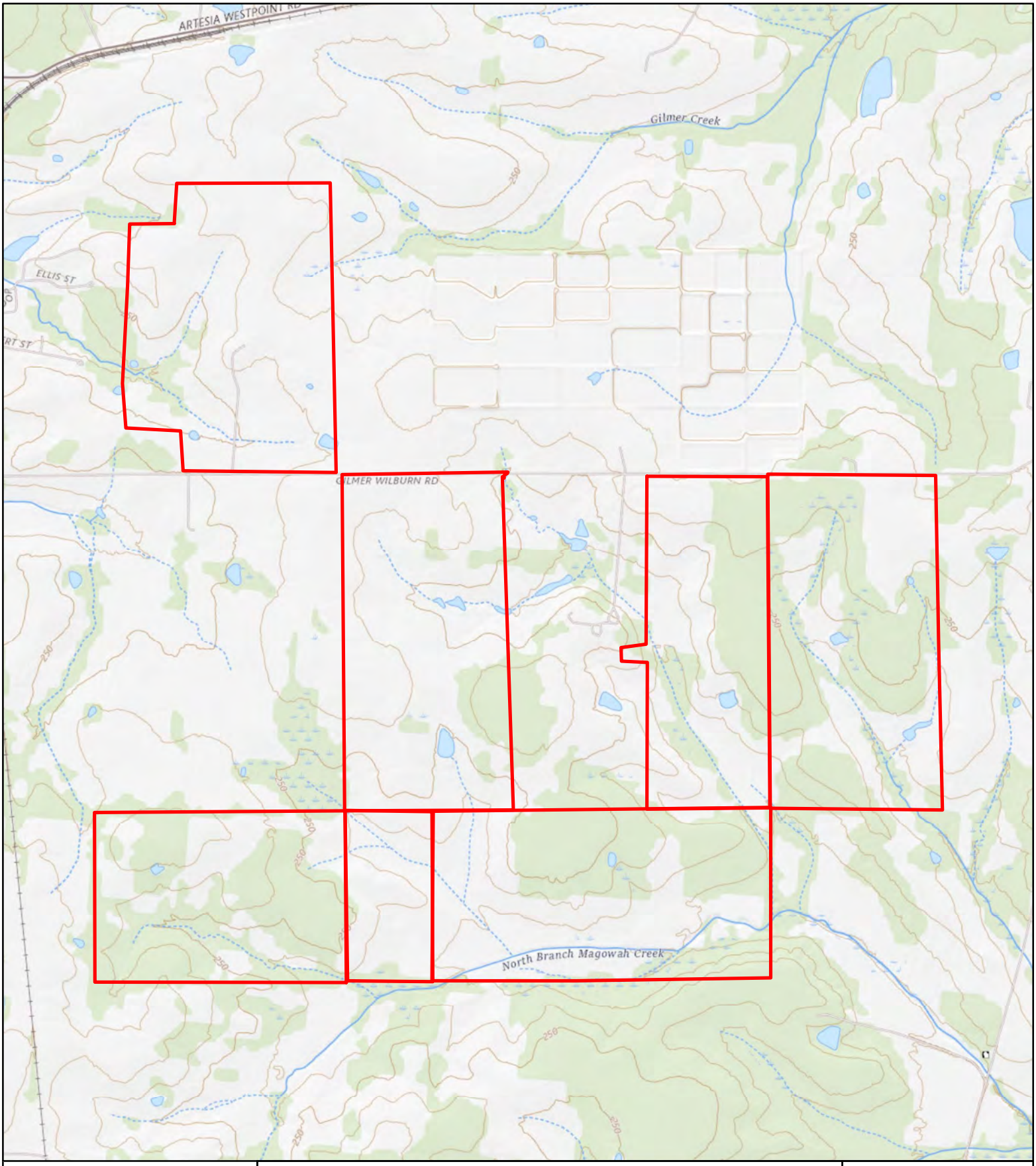


Figure 7
USGS Quadrangle Map

Golden Triangle Solar Phase 2
prepared for
MS Solar 6, LLC

Lowndes County Mississippi

Legend

Site Boundary

N

0 1,000 2,000
Feet

PREPARED BY

Kimley»Horn

June 2021

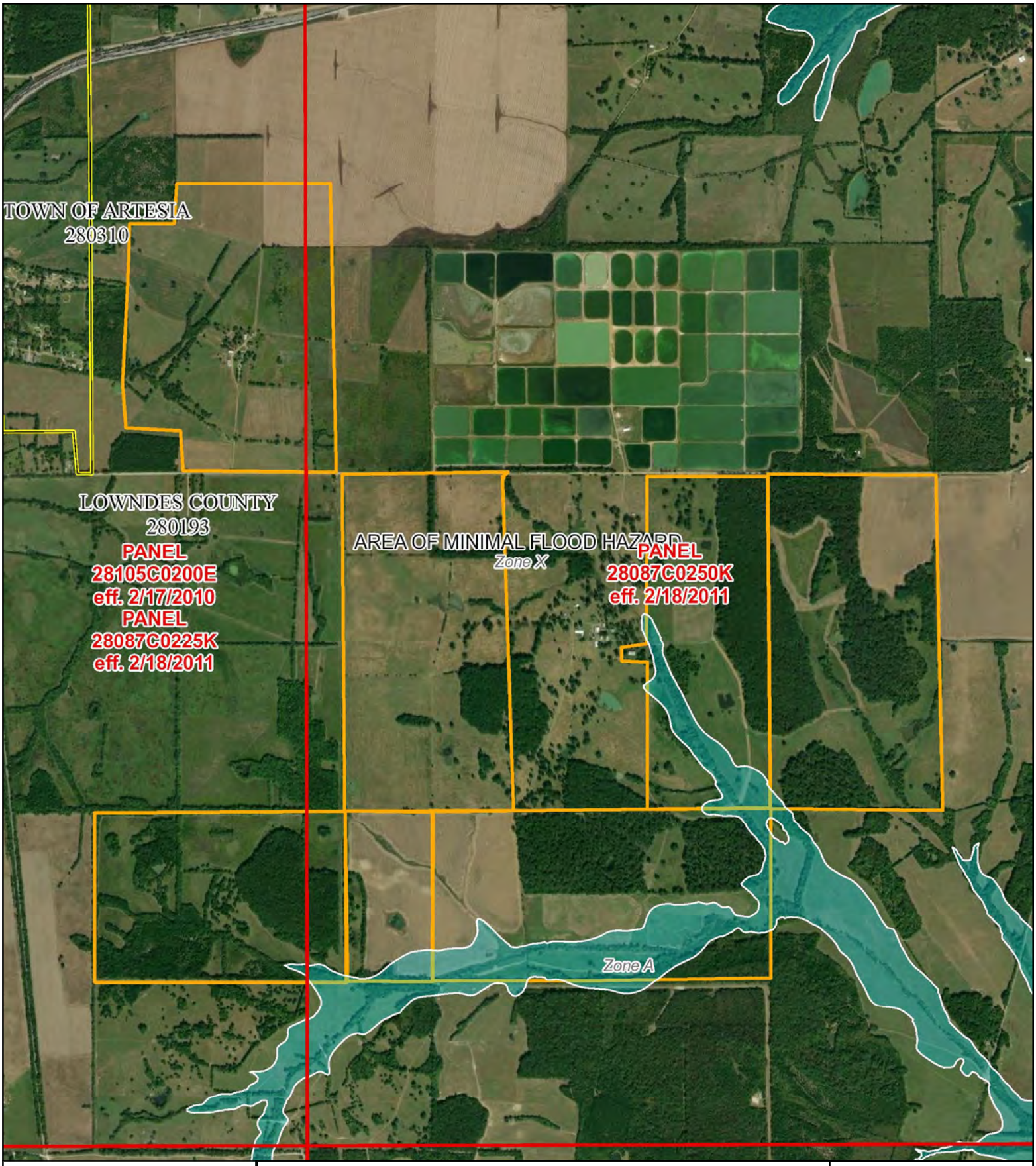


Figure 8
FEMA FIRM Map

Golden Triangle Solar Phase 2
prepared for
MS Solar 6, LLC

Lowndes County Mississippi

Legend

- Site Boundary
- FIRM Panels
- Profile Baselines
- Transect Baselines
- Political Jurisdictions

Flood Hazard Boundaries

- Other Boundaries

Line Type

- Limit Lines
- SFHA / Flood Zone Boundary
- Water Lines

Flood Hazard Zones

Zone Type

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee

N

0 1,000 2,000 Feet

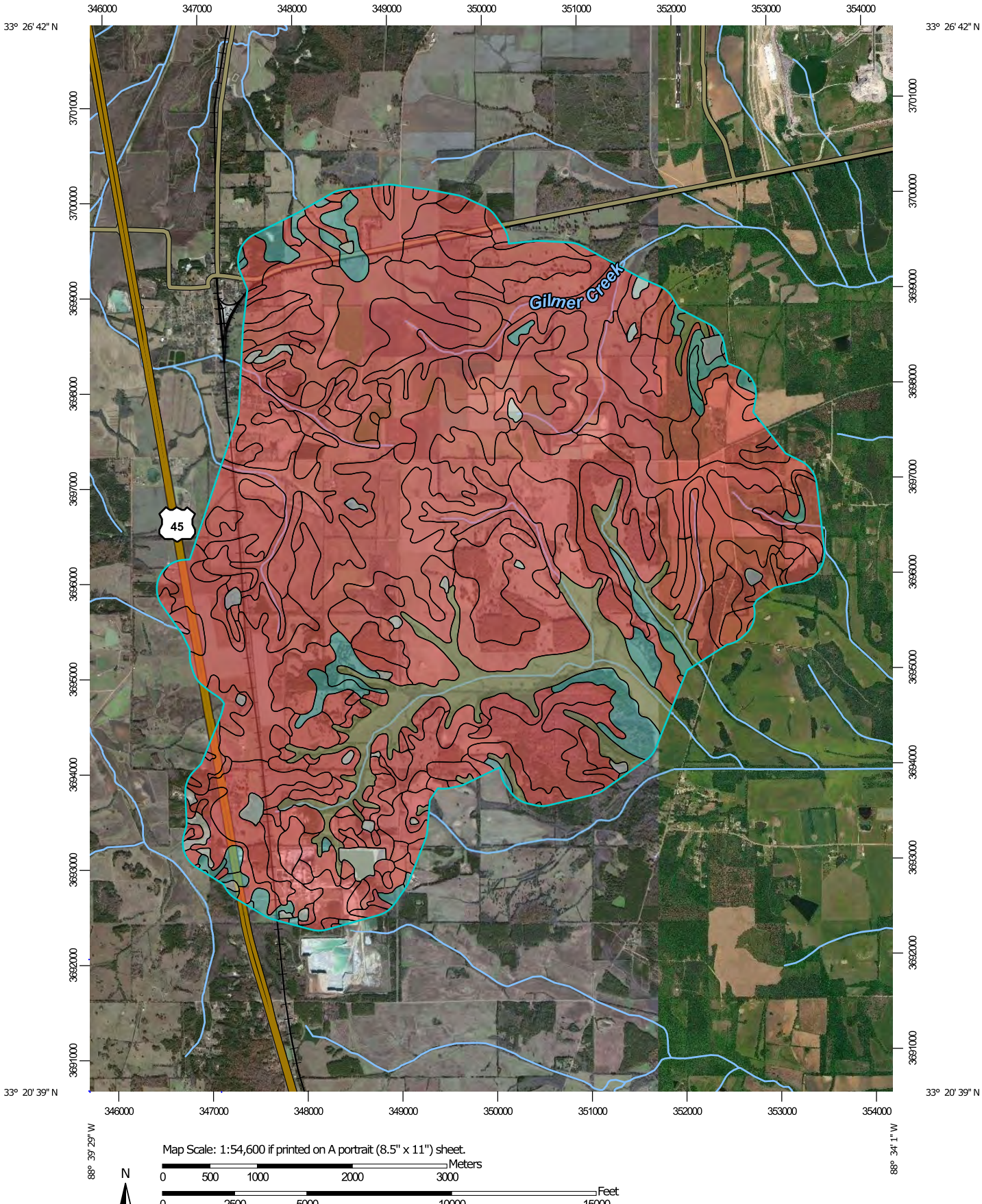
PREPARED BY

Kimley»Horn

June 2021

Figure 9. NRCS WSS Site Soil Map

Hydrologic Soil Group—Lowndes County, Mississippi
(Golden Triangle Phase 2 Existing Conditions)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lowndes County, Mississippi
Survey Area Data: Version 15, Jun 3, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 3, 2010—Jun 7, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BrA	Brooksville silty clay, 0 to 1 percent slopes	D	1,132.1	12.8%
BrB	Brooksville silty clay, 1 to 3 percent slopes	D	1,445.8	16.4%
Cp	Catalpa silty clay	C/D	615.0	7.0%
DeC2	Demopolis-Binnsville complex, 2 to 8 percent slopes, eroded	D	608.5	6.9%
Gr	Griffith silty clay	D	187.5	2.1%
KpB2	Kipling silty clay loam, 2 to 5 percent slopes, eroded	D	62.7	0.7%
KpC2	Kipling silty clay loam, 5 to 8 percent slopes, eroded	D	2.8	0.0%
Le	Leeper silty clay, 0 to 2 percent slopes, occasionally flooded	D	473.1	5.4%
OkA	Okolona silty clay, 0 to 1 percent slopes	D	317.6	3.6%
OkB	Okolona silty clay, 1 to 3 percent slopes	D	919.0	10.4%
SuB2	Sumter silty clay loam, 2 to 5 percent slopes, eroded	C	178.1	2.0%
SuC2	Sumter silty clay loam, 5 to 12 percent slopes, eroded	C	269.4	3.1%
SvD3	Sumter-Demopolis-Chalk outcrop complex, 5 to 20 percent slopes, severely eroded		44.6	0.5%
VaA	Vaiden silty clay, 0 to 2 percent slopes	D	1,196.3	13.6%
VaB2	Vaiden silty clay, 2 to 5 percent slopes, eroded	D	1,247.9	14.1%
VaC2	Vaiden silty clay, 5 to 8 percent slopes, eroded	D	13.1	0.1%
W	Water		110.1	1.2%
Totals for Area of Interest			**8,823.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX D
PROTECTED SPECIES INFORMATION AND REPORTING

Protected Species Habitat Assessment Report

MS Solar 6, LLC

Golden Triangle II Solar Project

Revision 4.0
12/8/2021

Protected Species Habitat Assessment Report

prepared for

MS Solar 6, LLC
Golden Triangle II Solar Project
Lowndes County, Mississippi

12/8/2021

prepared by

Burns & McDonnell Engineering Company, Inc.
Atlanta, Georgia

COPYRIGHT © 2021 BURNS & McDONNELL ENGINEERING COMPANY, INC.

TABLE OF CONTENTS

Page No.

1.0 INTRODUCTION 1-1

2.0 METHODOLOGY 2-1
2.1 Review Existing Information 2-1
2.2 Environmental Field Surveys 2-2

3.0 RESULTS 3-1
3.1 Land Use Types 3-1
3.1.1 Active Agriculture and Pasture 3-1
3.1.2 Forest 3-2
3.1.3 Wetlands 3-3
3.1.4 Streams 3-3
3.2 Protected Species Information 3-4
3.2.1 Species Protected under the Endangered Species Act 3-4
3.2.2 Bald Eagles and Migratory Birds 3-7
3.2.3 TVA Natural Heritage Database Results 3-11

4.0 CONCLUSIONS 4-1

5.0 REFERENCES 5-1

APPENDIX A - PROTECTED SPECIES INFORMATION
APPENDIX B - MAPS AND FIGURES
APPENDIX C - REPRESENTATIVE PHOTOGRAPHS
APPENDIX D – ACOUSTIC BAT SURVEY REPORT

LIST OF TABLES

Page No.

Table 3-1: Mississippi Department of Wildlife, Fisheries, and Parks - Natural Heritage Program -Protected Species and Species of Special Concern Potentially Occurring within two miles of the Survey Area 3-6
Table 3-3: TVA Heritage Database Plants Potentially Occurring within the Project Site 3-11

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
dbh	diameter at breast height
ESA	Endangered Species Act of 1973
GIS	Geographic Information System
Hwy	Highway
HUC	Hydrologic Unit Code
IPaC	Information for Planning and Conservation
MBTA	Migratory Bird Protection Act
MDWFP	Mississippi Department of Wildlife, Fisheries, and Parks
MS	Mississippi
MW	megawatt
NLEB	Northern long-eared bat
NRCS	Natural Resources Conservation Service
PEM	palustrine emergent
PFO	palustrine forested
PSS	palustrine scrub shrub
PUB	palustrine unconsolidated bottom
Project	Golden Triangle Solar Project
ROW	Right-of-way
SR	State Route
TVA	Tennessee Valley Authority
US	United States
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

MS Solar 6, LLC, is evaluating a site in Lowndes County, Mississippi (MS) for potential development of a 150 megawatt (MW) solar energy facility (Golden Triangle Solar II Project or Project). Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was contracted by MS Solar 6, LLC, to conduct a habitat assessment for the proposed Project, specifically potential parcels upon which solar array facility sites may be installed, in Lowndes County, MS (**Figure 1, Appendix A**). The Survey Area consists of approximately 1,525 acres of land that is predominantly used for pasture, hay production, and agriculture with fragmented forested areas throughout. The Project is east of the US Hwy Alt 45, south and adjacent to Gilmer Wilburn Road, North of Swedenburg Road, and west of Hardy Billups Road in Artesia, MS, which is approximately 8 miles east of Starkville, MS and 10 miles west of Columbus, MS. The Project was surveyed for ecological resources on March 8 through March 13, 2021.

Burns & McDonnell ecologists evaluated characteristics of the Project limits to determine presence or absence of suitable habitat for federal and/MDWFP Natural Heritage Database rare species. The habitat assessment survey was conducted throughout all parcels being considered for the proposed Project (Survey Area) as identified by MS Solar 6, LLC. Based on results of this protected species habitat assessment, in addition to results from other environmental and civil surveys, MS Solar 6, LLC will implement a project design that minimizes environmental impacts to the greatest extent practicable.

2.0 METHODOLOGY

Key methods used for determining the presence or absence of potential and suitable protected species habitats within the Survey Area are: Review of existing publicly available information published by federal and states agencies such as the U.S. Fish and Wildlife Service (USFWS), Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP), Tennessee Valley Authority's (TVA) Natural Heritage Database, and performing pedestrian surveys.

2.1 Review Existing Information

Prior to conducting field work, Burns & McDonnell biologists reviewed USFWS Information for Planning and Consultation (IPaC) results letter (Appendix A) sent to Burns & McDonnell on April 20, 2021. The IPaC provides information regarding special status species with potential to occur within the Survey Area (Consultation Code: 04EM1000-2021-SLI-0745, Event Code: 04EM1000-2021-E-01680). Using the information provided in the IPaC, Burns & McDonnell's field team assessed whether the proposed Project had potential to affect certain species that are protected under the Endangered Species Act of 1973 (ESA) specifically those species that are federally listed, proposed and/or candidate species), as well as bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), migratory birds (including raptor species), and the occurrence of suitable habitat for these species within the Survey Area. Additionally, consultation was conducted with MDWFP's National Heritage Program which provided a list of state protected species and state ranked species of special concern with potential to occur within two miles of the Survey Area. U.S. Fish and Wildlife's Range Wide Indiana Bat Survey Guidelines (USFWS, 2019) was also reviewed. Lastly, review of TVA's natural heritage data was reviewed which provides known occurrences of rare species within three and five miles of the Survey Area for terrestrial and botanical species, respectively.

Field maps were created using the available Geographic Information System (GIS) data including U.S. Geological Survey (USGS) topographic data and Natural Resources Conservation Service (NRCS) soil survey data. This information was thoroughly reviewed to determine which protected species could occur within the Survey Area. In addition to federal and state agency sources, a literature review was conducted on each species for pertinent information regarding species' distinct physical characteristics, vegetative preferences, diet, motility, home range requirements, reproductive needs, and sensitivity to anthropogenic disturbances.

Based on a review of available information (Appendix A), it was determined suitable habitat may occur within the Survey Area for three federally protected species, one of which is also a state-listed species.

Additionally, based on data provided by MWDFP Natural Heritage Program through consultation, there are 15 state ranked species of special concern with potential to occur within two miles of the Survey Area.

2.2 Environmental Field Surveys

Field surveys were conducted from March 8 - 13, 2021. The Survey Area begins on the south side of US Hwy 82/State Route (SR) 12 and extends south to Gilmer-Wilburn Road (Vicinity Map, Appendix B). The survey was conducted within five parcels under consideration for the proposed Project. The Survey Area encompassed approximately 1,525 acres (Survey Area Map; Appendix B).

During the field surveys, data was collected on existing vegetative cover/land use, potentially suitable habitats of protected species, and general wildlife observations. The field investigation consisted of pedestrian surveys within the Survey Area depicted in the Survey Area Map for components of the overall Project.

Additionally, in accordance with TVA's agreement with the USFWS, it was determined that presence/absence surveys should be conducted to assess potential occurrence of the northern long-eared bat (NLEB). Accordingly, Burns & McDonnell conducted presence/absence surveys for the NLEB using acoustic methods on August 3 through August 10, 2021. The survey protocol followed the most current (2020) U.S. Fish and Wildlife (USFWS) *Rangewide Indiana Bat Survey Guidelines* (Guidelines).

3.0 RESULTS

3.1 Land Use Types

The Project is within the U.S. Environmental Protection Agency (USEPA) Blackland Prairie Ecoregion (Level 4) and is within the Middle Tombigbee River [Hydrologic Unit Code (HUC) 03160106] and Tibbee Creek (HUC 03160104) watersheds.

Four dominant vegetative cover/land use communities were observed within the Survey Area, including active agriculture/pasture, bottomland hardwood forest, and upland forest (Figures 3A-3N: Habitat Maps, Appendix B). Descriptions of these communities are provided below and representative photographs of each habitat community type are provided in Appendix C.

3.1.1 Active Agriculture and Pasture

Active agricultural and pasture is the primary land use community found in the Survey Area and composed approximately 73.64 percent (1123 acres) of the Survey Area. Areas identified as active agriculture include cattle pasture, hay production, and row crop fields. Vegetation in these communities is maintained in an early successional state due to crop growth/harvesting, and regular management/mowing as well as repeated cattle grazing. Corn is planted in late spring and covers the row crop fields on approximately 125 acres. Vegetation observed in pastures consists of primarily tall fescue grass (*Festuca arundinacea*), Johnson grass (*Sorghum halepense*), annual bluegrass (*Poa annua*), couch grass (*Elymus repens*), bermuda (*Cynodon dactylon*), annual ragweed (*Ambrosia atemisiifolia*), cheatgrass (*Bromus tectorum*), perennial ryegrass (*Lolium perenne*), green foxtail (*Setaria viridis*), butterweed (Packera glabella), bulbous bittercress (*Cardamine bulbosa*), soft rush (*Juncus effusus*), Cherokee sedge (*Carex cherokeensis*), fox sedge (*Carex vulpinoidea*), red sorrel (*Rumex acetosella*), curly dock (*Rumex crispus*), prairie fleabane (*Erigeron strigosus*) , jimsonweed (*Datura stramonium*), Carolina horsenettle (*Solanum carolinense*), bull thistle (*Cirsum vulgare*), wild violet (*Viola sororia*), field garlic (*Allium vineale*), and sensitive partridge pea (*Chamaecrista nictitans*).

Observations of garter snake (*Thamnophis sirtalis*), blue bird (*Sialia sialis*), killdeer (*Charadrius vociferus*) and field sparrow (*Spizella pusilla*) were documented in open pasture and active agriculture habitats. Flyovers of American crow (*Corvus brachyrhynchos*), black vulture (*Coragyps astratus*), and red-tailed hawk (*Buteo jamaicensis*) also were observed in these areas.

3.1.2 Forest

Approximately 17.6 percent (268 acres) of the Survey Area is composed of both upland and bottomland forested areas..

Bottomland Forest

Bottomland hardwood forest communities in the Survey Area are composed of a canopy age ranging from approximately 20 to 70+ years old. Dominant vegetation observed consisted of water hickory (*Carya aquatica*), willow oak (*Quercus phellos*), cherrybark oak (*Quercus pagoda*), swamp chestnut oak (*Quercus michauxii*), silky dogwood (*Cornus amomum*), osage orange (*Maclura pomifera*), green ash (*Fraxinus pernnsylvanica*), eastern red cedar (*Juniperus virginiana*), water locust (*Gledista aquatica*), shagbark hickory (*Carya ovata)*, box elder (*Acer negundo*), red maple *(Acer rubrum*), American sycamore (*Platanus occidentalis*), sugarberry (*Celtis laevigata*), Cherokee sedge (*Carex cherokeensis*), wild petunia (*Ruellia humilis*), tall fescue, poison ivy (*Toxicodendron radicans*), greenbrier (*Smilax rotundifolia*), Virginia spiderwort (*Tradescantia virginiana*), Virginia creeper (*Parthenocissus quinquefolia*), prairie ironweed (*Vernonia fasciculata*), hairy buttercup (*Ranunculus sardous*), and resurrection fern (*Pleopeltis polypodioides*),

Upland Forest

Upland forest communities in the Survey Area and are composed of a canopy age ranging from approximately 20 to 70 years old. Dominant vegetation observed consisted of white oak (*Quercus alba*), southern red oak (*Quercus falcata*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), mockernut hickory (*Carya tomentosa*), shagbark hickory, pignut hickory (*Carya glabra*), loblolly pine (*Pinus taeda*), eastern red cedar, American elm (*Ulmus americana*), honey locust (*Gleditsia triacanthos*), osage orange, Chinese privet, Devil's walkingstick (*Aralia spinosa*), Christmas fern (*Polystichum acrostichoides*), Japanese honeysuckle (*Lonicera japonica*), multiple greenbrier species (*Smilax spp*.), muscadine (*Vitus rotundifolia*.), Virginia creeper, blackberry (*Rubus spp*.), wooly panic grass (*Dichanthelium acuminatum*), and wild violet (*Viola sororia*).

Observations of American Robin (*Turdis migratorius*), northern mockingbird (*Mimus polyglottos*), cedar waxwing (*Bombycilla cedrorum*), downy woodpecker (*Dryobates pubescens*), great-horned owl (*Bubo virginianus*), upland chorus frog (*Pseudacris feriarum*), and eastern king snake (*Lampropeltis getula*) were noted in both of the upland and bottomland forest areas.

3.1.3 Wetlands

During the field surveys, a total of 20 open waters and 19 wetlands were identified within the Survey Area of the Project. Palustrine unconsolidated bottom wetlands (PUB) accounted for approximately 14.15 acres (less than one percent) of the total Survey Area and were primarily located in open fields. Common vegetation associated with the banks and riparian areas of the PUBs consisted of tall fescue, white clover, tall buttercup, little blue stem, annual bluegrass, scutch grass, curly dock, spike rush, an unknown sedge (*Carex sp*.), *Rubus sp*., Osage orange, and black willow. Representative photographs of wetland habitat community types are provided in Appendix C.

Palustrine forested wetlands (PFO) accounted for less than one percent (2.8 acres) of the total Survey Area. The common overstory and understory vegetation consists of sugarberry, osage orange, green ash, American sycamore, red maple, Chinese privet; and common vines, shrubs, and herbaceous vegetation consisting of poison ivy, saw-tooth blackberry, butterweed, alligator weed, Virginia creeper, Virginia wild rye, and soft rush.

Palustrine emergent wetlands (PEM) accounted for less than one percent (11.89 acres) of the total Survey Area. Common vegetation observed within the emergent wetlands included black willow, butterweed, shallow sedge, rough cockleburr, woolgrass (*Scirpus cyperinus*), curly dock, yellow nutsedge, blackberries, soft rush, and alligator weed.

Palustrine scrub/shrub wetlands (PSS) accounted for less than one percent (2.49 acres) of the total Survey Area. Common vegetation observed within the scrub/shrub wetlands included, green ash, water locust, butterweed, curly dock, and soft rush.

Several observations of garter snakes, red-eared sliders (*Trachemys scripta),* upland chorus frogs*, a* cottonmouth (*Agkistrodon piscivorus*)*,* and banded water snake (*Nerodia fasciata*) were documented in wetlands within the Survey Area. Wading birds included great blue heron (*Ardea herodius*) and great egret (*Ardea alba*), which were observed near the norther portion of the Survey Area near the aquaculture ponds (across from Gilmer Wilburn Rd). Mallard ducks (*Anas platyrhynchos*) and gambusia sp. were observed in many of the ponds within the Survey Area. Evidence of North American beaver (*Castor canadensis*) activity was also observed in several locations within the Survey Area.

3.1.4 Streams

Of the 59 streams mapped within the Survey Area, there were 6 perennial streams (totaling 25,525 linear feet), 22 intermittent streams (totaling 13,138 linear feet), and 31 ephemeral streams (totaling 12,295

linear feet). At the time of survey, most ephemeral streams did not contain water. Most perennial streams had limited flow and fragmented sections of water throughout the reaches.

Observations of gambusia were documented during field surveys. However, no fish or macroinvertebrate sampling was conducted. No other observations of aquatic species were documented. Representative photographs of each stream flow regime type are provided in Appendix C.

3.2 Protected Species Information

3.2.1 Species Protected under the Endangered Species Act

The USFWS IPaC for the Survey Area was reviewed to determine the potential occurrence of species listed by the USFWS as threatened, endangered, or species of special concern (**Appendix A**). Three federally listed species were identified as potentially occurring within the Survey Area: the northern long-eared bat (*Myotis septentrionalis*), the wood stork (*Mycteria americana*), and Price's potato-bean (*Apios priceana*). Critical habitat for federally protected species has not been designated within Lowndes County, Mississippi for any of these species.

3.2.1.1 Wood Stork

The wood stork (*Mycteria americana*) is a federally threatened bird found primarily in freshwater wetlands, including ponds, bayheads, flooded pastures, oxbow lakes, and ditches. Wood storks typically develop roosting sites in medium to tall trees that occur in stands either in swamps or on islands surrounded by relatively broad expanses of open water; primarily bald cypress (*Taxodium distichum*) swamps. Nesting usually occurs in bald cypress trees in swamps. According to Cornell Lab's wood stork sightings map from 2016-2021, there have historically been sightings near the Survey Area; however, wood stork is primarily a non-migratory bird in the United States and typically occurs in South Carolina, Georgia, and Florida (Cornell, 2021). No nesting records are known from this area of Mississippi (USFWS 2020b). Wetlands within the Survey Area were small, isolated, and low quality (Appendix C). Therefore, no suitable roosting habitat for wood storks was observed within the Survey Area; however, marginal foraging habitat for the species was observed within most of the open waters throughout the Survey Area. Proposed solar array layouts would be designed to minimize impacts to wetlands that could potentially provide wood stork foraging habitat.

3.2.1.2 Northern Long-eared Bat

The northern long-eared bat is a federally threatened mammal that roosts in tree cavities and under exfoliating bark, but this species has also been found in buildings and behind window shutters. During the

winter, northern long-eared bats hibernate in tight crevices in caves and mines. Foraging is done primarily on forested hillsides and ridges.

Potentially Suitable Northern Long-Eared Bat Summer Roosting Habitat

In the USFWS's Range-Wide Indiana Bat Survey Guidelines (USFWS, 2019), suitable summer habitat for NLEB is defined as follows:

"Suitable summer habitat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height [dbh] that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of forested/wooded habitat. NLEB has also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. NLEBs typically occupy their summer habitat from mid-May through mid-August each year; and the species may arrive or leave some time before or after this period.

Examples of unsuitable habitat:

- Individual trees that are greater than 1,000 feet from forested/wooded areas.
- Trees found in highly developed urban areas (e.g., street trees, downtown areas); and
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees."

Suitable roosting habitat for the NLEB was observed within most of the forested areas, and suitable foraging habitat was observed within the perennial stream corridors throughout the Survey Area (**Habitat Assessment Map; Appendix B**). Suitable roosting habitat was observed as mixed hardwood forest with an even representation of shagbark hickory with exfoliating bark and scattered snags throughout. No caves or mines were identified on the Project Site during field surveys. Additionally, in speaking with landowners during site visits, no known caves or mines exist in proximity to Survey Area. Photographs representing examples of suitable bat habitat with the Survey Area are provided in (**Appendix C**). According to TVA's natural heritage database, there are no known records of NLEB within ten miles of the Survey Area.

3.2.1.3 Price's Potato-bean

Price's potato-bean (*Apios priceana*) is a federally threatened plant that prefers lightly disturbed areas such as forest openings, wood edges and where bluffs descend to streams. It also grows along highway ROWs and powerline corridors. There are no bluffs that descend to streams within this Survey Area. One area of potentially suitable habitat for the species was observed where there is minor north facing slope towards a perennial stream shown in (Habitat Assessment Map; Appendix B). However, no individual Price's potato-bean were observed during field surveys. If identified suitable habitat for Price's potato-bean cannot be avoided/removed from the project area, species specific surveys would be conducted by a qualified botanist during the USFWS' recommended optimal survey window (late July – August).

3.2.2 Mississippi Natural Heritage Program State Protected Species and Species of Special Concern

The Mississippi Natural Heritage Program is managed under the MDWFP, Museum of Natural Science. Consultation was initiated with the MDWFP on February 25, 2021, and database results were issued on March 18, 2021, which indicate occurrences of state listed species or species of special concern that are known to occur within two miles of the Survey Area. Results of that correspondence are in Appendix A. According to the results, one state-listed species, the federally threatened wood stork, and 15 state ranked species of special concern have potential to occur within the Survey Area. Furthermore, MDWFP concluded that if best management practices are properly implemented, monitored, and maintained, the proposed project likely poses no threat to listed species or their habitats. Each of the species and a description of its preferred habitat is provided below. The state protected species identified are listed in Table 3-1 and discussed in further detail below.

Table 3-1: Mississippi Department of Wildlife, Fisheries, and Parks - Natural Heritage Program - Protected Species and Species of Special Concern Potentially Occurring within two miles of the Golden Triangle II Project Survey Area

Common Name	Scientific Name	Federal Status	State Status	Preferred Habitat Description
Eastern Spotted Skunk	*Spilogale putorius*	-	S1	Open prairies, brushy lands, and cultivated areas (MDC 2021)
Wood Stork	*Mycteria americana*	LT	LE	Freshwater wetlands, including ponds, bayheads, flooded pastures, oxbow lakes, and ditches (Cornell 2019a)
Painted Bunting	*Passerina ciris*	-	S3B	Dense weedy habitats as well as the dense understory of semi-open forests (Cornell 2019b)
Scissor-tail Flycatcher	*Tyrannus forficatus*	-	S1B; S1N	Open habitats in the southern Great Plains and south Texas, often around sparsely scattered trees or utility lines (Cornell 2019c)
Big-head Evax	Evax *Prolifera*	-	S1	Meadows, grasslands, sagebrush steppe, and plains (MNHP 2021)

Common Name	Scientific Name	Federal Status	State Status	Preferred Habitat Description
Slender Sedge	*Carex gracilescens*	-	S1	Mesic deciduous forest; often in sandy, rocky, and sometimes calcareous soils (WDNR 2020)
Stiff Greenthread	*Thelesperma filifolium*	-	S1	Disturbed sites in dry sandy or gravely soil (UTA 2018)
Nebraska Sedge	*Carex jamesii*	-	S1S2	rich mesic woodlands, wooded slopes, wooded groves (where the ground vegetation is infrequently mowed underneath large trees), and edges of woodland paths (Hilty 2020a)
Big Shellbark Hickory	*Carya laciniosa*	-	S2	Rich alluvium of floodplains and rich mesic soil along riverbanks and marshes (NYNHP 2021)
Bur Oak	*Quercus macrocarpa*	-	S2	Moist woodlands and bottomland forests to prairies and sandhills (USFS 2021)
Ohio Buckeye	*Aesculus glabra*	-	S2	Moist to mesic deciduous woodlands, wooded valleys along rivers, and rocky wooded slopes in sheltered areas (Hilty 2020b)
Prairie Parsley	*Polytaenia nuttallii*	-	S2	Upland prairies, hill prairies, limestone glades, chert glades, thinly wooded bluffs, and savannas (Hilty 2018).
Prairie Pleatleaf	*Nemastylis geminiflora*	-	S2	Glades, prairies, and rocky slopes, on calcareous substrates – Occasionally on glades in the shade of eastern red cedars or Ashe's junipers (MDC 2020)
Small-toothed Sedge	*Carex microdonta*	-	S2	Dry to moist, calcareous substrates in open rocky or wet prairies, swales, seeps, and ditches - Relic patches of Blackland prairies, limestone glades, and chalk openings (FNA 2020)
Mead's Sedge	*Carex meadii*	-	S3S4	moist to dry black soil prairies, dolomite prairies, hill prairies, savannas with sparse ground vegetation, sedge meadows, limestone glades, and areas along railroads (Hilty 2019a)
Carya myristiciformis	*Nutmeg Hickory*	-	S3S4	Banks of rivers and swamps in rich moist soils, occasionally on higher ground and often on limestone (PFAF 2021)

Key: Statuses are LE= Listed Endangered, LT= Listed Threatened

State Rank S1 - Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

S2 - Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation. S3 - Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences).

Sources: USFWS, 2021 and Mississippi Natural Heritage Program, 2021.

3.2.3 Bald Eagles and Migratory Birds

In Mississippi, the bald eagle is protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Protection Act (MBTA). No bald eagles or nests were observed during the environmental field surveys within the Survey Area. One potential bald eagle nest was observed from a distance in the adjacent parcel outside of the Survey Area, approximately 1,700 ft away but could not be confirmed. The potential nest is within private property outside of the Survey Area. Photographs were attempted but were unable to provide value due to distance and obstruction. Status of the nest is unknown,

and no individuals were observed. Bald eagles would be most likely found near the Project Site in December and January. There are aquaculture ponds directly north and south of the Project Site which could provide a source of food for the bald eagle. No nests were observed within the Survey Area during field surveys; however, bald eagles could exist near the Project Site due to the aquaculture ponds. According to TVA's natural heritage data, there are no known bald eagles within three miles of the Survey Area.

According to the USWFS IPaC report, there are no migratory birds of concern protected under the MBTA within the vicinity of the Survey Area (USFWS 2021). Migratory birds of conservation concern identified in TVA's natural heritage data include American kestrel, bald eagle, cerulean warbler, dunlin, Kentucky warbler, lesser yellowlegs, marbled godwit, prothonotary warbler, red-headed woodpecker, rusty blackbird, short-billed dowitcher, swallow-tailed kite, willet, and wood thrush. Additionally, MDWFP indicated that scissor-tail flycatcher and the painted bunting could also occur within two miles of the Survey Area. Both species are state species of concern.

The American Kestrel is a small member of the falcon family and prefers habitats consisting of open farmland, wood edges, and cities. It breeds from April through August most likely in areas outside the Project Site (Cornell 2019d). It is most commonly found in Lowndes County, Mississippi during December, and January. No individuals or nests were observed during field surveys; however suitable nesting and foraging habitat does occur within the Survey Area.

Ospreys (*Pandion haliaetus*) are large birds of prey that typically nest in elevated nest sites near rivers, lakes, reservoirs, lagoons, swamps, and marshes with an adequate supply of accessible fish within about twelve miles of the nest (Cornell 2019e). According to TVA's natural heritage data, there is a record from 2011 of an osprey's nest approximately 2.7 miles from the Survey Area. No nests were observed during field surveys; however, osprey could exist near the Survey Area due to the proximity of the aquaculture ponds.

Lesser yellowlegs (*Tringa flavipes*) is a small "piper" bird that breeds in meadows and open woodlands in Canada. In North America, lesser yellowlegs typically occurs in marshes, shallow wetlands, shorelines, and flooded fields during migration. Most often, they prefer vegetated wetlands rather than bare habitats (Cornell 2019b). Marginal foraging habitat is present at PEM wetlands throughout the Project Site. PEM wetlands within the Survey area were low quality, isolated, and are regularly disturbed during crop and hay harvesting (Appendix C).

Marbled godwit (*Limosa fedoa*) is a small shorebird with a two-toned, long, slightly upcurved bill that breeds in the shortgrass prairies near wetlands in Canada and the northern central U.S. While migrating south, marbled godwits typically inhabit native grass prairies with green needle grass, western wheatgrass, blue gram, needle-and-thread, and blue stem. Wintering grounds typically consist of coastal mudflats, estuaries, and sandy beaches (Cornell 2019c). The migration corridor for the marbled godwit is further west of the Survey Area, closer to Texas and Arkansas. Due to lack of suitable habitat and the location of the Survey Area outside of the migration corridor, marbled godwit is unlikely to occur within the Survey Area.

Red-headed woodpecker (*Melanerpes erythrocephalus*) is a medium-sized woodpecker with a bright red head, white buff, and black back. Red-headed woodpeckers breed in river bottoms, beaver swamps, burned areas, recent clearing, deciduous woodlands with oak or beech and groves of dead or dying trees. Dead or partially dead trees are important for nest cavities in areas where they breed. In Mississippi, red-headed woodpeckers typically inhabit pine and pine-oak forests (Cornell 2019d). Most of the undisturbed forested areas within the Survey Area would provide suitable habitat for red-headed woodpeckers.

As its name entails, the rusty blackbird (*Zanata Canadiense*) has distinctively rusty feather edges and pale-yellow eyes. Rusty blackbirds typically breed in wet forests, swamps, bogs, and beaver ponds. They also winter in swamps, woodlands, and pond edges. This species is considered a common bird in steep decline due to habitat loss (Cornell 2019e). Potentially suitable habitat for rusty blackbird is present near the pond edges and riparian woodlands to the open ponds.

Short billed dowitcher (*Limnodromus griseus*) is a full-bodied orange, brown, and golden shorebird with a long bill used for rhythmic probing of mudflats and flooded field for food. Short-billed dowitchers breed in the taiga shield ecotone, nest in wetlands usually near edges of bogs, small lakes, or wet meadows. During winter months, short-billed dowitchers are founds in saltwater and brackish environments such as estuaries and lagoon with tidal influences (Cornell 2019f). Marginal foraging habitat for migrant short-billed dowitchers is present in some of the shallow ponds and potentially flooded farm fields when excessive precipitation occurs.

Willet (*Tringa semipalmata*) is a straight billed, mottled brown, shorebird with distinct wing markings and a piercing call. Willets typically inhabit open beaches, marshes, mudflats, and rocky coastal zones. During the breeding season eastern willets are typically found in saltmarshes, barrier islands, and barrier beaches (Cornell 2019g). Marginal foraging habitat for migrant willets is present in some of the shallow ponds and potentially flooded farm fields from excessive precipitation.

MDWFP's Natural Heritage Data also identified two migratory birds with potential to occur within two miles of the Survey Area:

Scissor tail flycatcher (*Tyrannus forficatus*) was identified by the MDWFP as potentially occurring within two miles of the Survey Area. Scissor tail flycatchers prefer open habitats in the southern Great Plains and south Texas, often around sparsely scattered trees, or utility lines (Cornell 2019c). Open pasture within the Survey Area provides marginal foraging habitat for the scissor-tailed flycatcher.

Painted Bunting (*Passerina ciris*) was also identified by the MDWFP as potentially occurring within two miles of the Survey Area. Painted bunting prefers dense weedy habitats as well as the dense understory of semi open forests (Cornell 2019b). Although they are typically more often found further south and west, most of the forested areas within the Survey Area provide foraging habitat.

If tree clearing activities associated with construction of the Project overlap with the primary nesting season (March 15 – September 15), short-term inadvertent impacts could occur on bird species that nest in or near the construction areas. To the extent practicable, Project construction will be scheduled to minimize potential effects to bird species by minimizing clearing activities within forested areas during nesting season. Other mitigation measures MS Solar 6, LLC plans to implement include:

- Designing Project facilities to avoid sensitive resources where possible.
- Maximizing locations where the Project utilizes agricultural areas.
- Limiting the construction and operation workspaces to the minimum necessary.
- Conducting mitigation for effects to sensitive resources (e.g., wetlands) through agency permit conditions.
- Avoiding forested areas, to the greatest extent practicable.
- Minimizing routine mowing/maintenance during the bird nesting season once the Project is complete (generally March 15 through September 15 in the general Project vicinity) to the extent feasible.

On Dec. 22, 2017, the U.S. Department of the Interior (DOI) revised its guidance on incidental take of migratory birds in Memorandum M-370501, which specifies that incidental take prohibitions apply only to actions that have *as their purpose* the taking or killing of migratory birds. Under the Biden administration, the Department of the Interior withdrew its 2017 legal opinion which preceded and form the basis of the rule. The new administration may return policies initiated under the Obama administration, which considered a proposal to develop an incidental take program. Because MS Solar 6, LLC's purpose is the lawful construction of a clean energy facility, and not the intentional take of

migratory birds, MS Solar 6, LLC does not anticipate further coordination with USFWS regarding migratory birds, however, legal developments to MBTA should be monitored.

3.2.4 TVA Natural Heritage Database Results

Terrestrial species documented in TVA's natural heritage data included northern long-eared bat, wood stork, osprey and bald eagle which are discussed above. Mitchell's satyr (*Neonympha mitchellii*) was also identified has having the potential to occur within the Survey Area, however, that species has not been documented within three miles of the project area or from Lowndes County, Mississippi. Additionally, Mitchell's satyr habitat is restricted to fens which are rare wetlands comprised of low nutrient systems that receive carbonate-rich ground water from seeps and springs which do not occur within the Survey Area (USFWS 2021b).

As of 2018, there are 495 plants of special concern in Mississippi. The designation of plants of special concern in Mississippi was developed for flagging sensitive species that may be adversely affected by proposed projects, determining protection priorities of natural areas that contain special plants, and determining priorities for inventory and protection for special plants to include proposing special plants for federal protection (Mississippi Natural Heritage Program, 2018).

Twenty-eight rare plant species were included in the results of the TVA Heritage Database search as potentially occurring within five miles of the Survey Area. Because MS Solar 6 is avoiding most of the wetland and stream riparian areas and chalk outcroppings and associated buffers from the construction and operation footprint, suitable habitat only exists for 12 of these plant species within the Project Site. The table below provides additional details for these 12 species.

Table 3-2: TVA Natural Heritage Database - Plants Potentially Occurring within the Survey Area

Common Name	Scientific Name	Rank	Preferred Habitat Description
Ridgestem false foxglove	*Agalinis oligophylla*	S2	Typically found from east Texas to southwest Louisiana on coastal plains primarily in prairies – Prefers moist to dry sand or clay soils and also found in pine hardwood forest and pine savannahs (USGS 2020)
Wild hyacinth	*Camassia scilloides*	S2	Black soil prairies, moist savannas, moist open woodlands along stream banks, rocky wooded slopes, and limestone glades - Typically prefer moist conditions to full sun to light shade in rich loamy soil (Hilty 2020c)
James's Sedge	*Carex jamesii*	S1S2	Mesic woodlands, wooded slopes, wooded groves, and edges of woodland paths - May also occur in upland woods and swampy woodlands and occasionally found in degraded woodland habitats (Hilty 2020a)

Common Name	Scientific Name	Rank	Preferred Habitat Description
Small-toothed sedge	*Carex microdonta*	S3	Dry to moist, calcareous substrates in open rocky or wet prairies, swales, seeps, and ditches - Relic patches of Blackland prairies, limestone glades, and chalk openings (FNA 2020)
Kingnut Hickory	*Carya laciniosa*	S2	Bottomland woodlands, upland woodlands, swamps, savannas, and limestone glades. Usually not far from rivers (Hilty 2020d)
Scarlet Indian-paintbrush	*Castilleja coccinea*	S1	Sandy soils in prairies and open woods (USFS 2020)
Pumpkin ash	*Fraximus profunda*	S3	Moist wet conditions often in swamps or floodplains, wet bottomlands, river valleys, and low areas. Often in bald cypress swamps, cottonwood, and tupelo swamps (MBG 2020a)
Canada moonseed	*Menispermum canadense*	S3	Deciduous woodlands, woodland borders, thickets, semi-shaded riverbanks, cleared powerline ROWs, overgrown fencerows, and hedges (Hilty 2020e)
Prairie pleatleaf	*Nemastylis geminiflora*	S2	Glades, prairies, and rocky slopes, on calcareous substrates – Occasionally on glades in the shade of eastern red cedars or Ashe's junipers (MDC 2020)
Bur oak	*Quercus macrocarpa*	S2	Bottomland soils in woodland and stream valleys (MBG 2020b)
Heath aster	*Symphyotrichum ericoides*	S2	Mesic to dry black soil prairies, gravel prairies, dolomite prairies, hill prairies, savannas, openings in dry rocky forests, limestone glades, roadsides and railroad sides, and pastures (Hilty, 2020f)
Southern Meadow Rue	*Thalictrum debile*	S1S2	Floodplain forests over calcareous substrates – prefers rich, rocky limestone woods often near streams (Chafin 2007).
Great Plains Ladies'-tresses	*Spiranthes magnicamporum*	S2	Open prairie and higher pH soils in both low and, moist areas and higher, gravelly sites (Minnesotawildflowers 2021)

S1 = Critically Imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation.
S2 = Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
S1S2 = Rank range between S1 and S2.
S3 = Vulnerable in Mississippi due to a restricted range (on the order of 21 to 100 occurrences), relatively few populations or occurrences, recent and widespread declines, or other factors making it vulnerable to extirpation.

Source: TVA's Heritage Database "Botany within 5 Miles"

During field surveys, one species of state listed tree was observed in the forested along the fence line of the southeast border of the Survey Area: bur oak (*Quercus macrocarpa*) (state ranked S2). Bur oak observations were limited to two individuals in lower elevations along a stream in the same general area. The two individuals were mature trees and had a diameter at breast height (dbh) of three to four feet. Representative photos are provided under Appendix C.

Two areas of open chalk outcrops and associated buffers were also mapped in the southwest portion of the Survey Areas as areas that could potentially support sensitive plant species and will be recommended as avoidance areas. No rare plants were observed at or near the chalk outcrops during surveys.

Table 3-4: TVA Natural Heritage Database – Aquatic Species Potentially Occurring within 10-miles of Survey Area.

Common Name	Scientific Name	Rank/Status	Preferred Habitat Description
Blue Sucker	*Cycleptus elongatus*	S3	Large rivers with deep channels and swift currents that have substrates consisting of sand, gravel or rubble bottoms. (MDNR 2021a)
Crystal Darter	*Crystallaria asprella*	S1/LE	Medium to large rivers, usually with moderate to swift currents and clean sandy or gravel bottoms (MDNR 2021b)
Cylinder Elimia	*Elimia cylindracea*	S2	Riffle habitats often in areas with rocky legdes (NatureServe 2021)
Flat Pigtoe	*Pleurobema marshalli*	SX/LE	Medium to large rivers with moderate to fast current and sandy gravel to gravel cobble substrates and clean water (NatureServe 2021b)
Frecklebelly Madtom	*Noturus munitus*	S2/LE	Fast moving streams associated with larger rivers that provide firm gravel substrates with pebbles and rock (USFWS 2020).
Freckled Darter	*Percina lenticula*	S2	Medium to large rivers with deep and swift currents (NatureServe 2021c)
Heavy Pigtoe	*Pleurobema taitianum*	SX/LE	Riffles and shoals of small to large rivers with sandy gravel to gravel-cobble substrates and moderate to fast currents (NatureServe 2021d).
Southern Clubshell	*Pleurobema decisum*	S1	Highly oxygenated small to medium rivers with loose sand and gravel substrates (NatureServe 2021e).
Southern Combshell	*Epioblasma penita*	S1/LE	Medium sized rivers with high gradient and riffles with sandy gravel to gravel cobble substrates in moderate to swift currents (NatureServe 2021f).
Stirrupshell	*Quadrula stapes*	SX/LE	Medium to large rivers with moderate to fast current and sandy gravel to gravel cobble substrates and clean water (NatureServe 2021g)
Striped Bass	*Morone saxatilis*	SH	Coastal estuaries; migrates upstream to medium to large rivers during spawning typically within 6 km of the shore (NatureServe 2021h).
White Heelsplitter	*Lasmigona complanata*	S3	Rivers and stream of various sizes with substrates of gravel, sand, or mud (NatureServe 2021i).

Common Name	Scientific Name	Rank/Status	Preferred Habitat Description
S1 = Critically Imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation. S2 = Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation. S3 = Vulnerable in Mississippi due to a restricted range (on the order of 21 to 100 occurrences), relatively few populations or occurrences, recent and widespread declines, or other factors making it vulnerable to extirpation. SH = Possibly Extirpated – Known from only historical records in Mississippi, but still some home of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. SX = Presumed Extirpated – Species or ecosystem is believed to be extirpated from Mississippi. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.			

The six perennial streams identified within the Survey Area had limited flow and fragmented sections of water throughout the reaches. Perennial streams within the Survey Area were characterized by the presence of a substantial volume of flow at the time of the site visit as well as secondary characteristics such as observance of fish and rooted aquatic fauna, indicating that water flows year-round. Perennial streams were approximately 6 to 25 feet in width at the OHWM with bank heights ranging from 3 to 25 feet. At the time of the delineation, the depth of water observed was 0.5 to 2.5 feet. Perennial streams flowed through upland fields, agricultural fields, and wooded riparian areas.

Observations of gambusia were documented during field surveys. However, no fish or macroinvertebrate sampling was conducted. No other observations of aquatic species were documented. Representative photographs of each stream flow regime type are provided in Appendix C.

With the exception of the white heelsplitter (S3), all aquatic species identified in the TVA Natural Heritage Database as potentially occurring within 10-miles of the Survey Area require aquatic habitats primarily comprised of medium to large rivers with moderate to fast moving currents. Perennial streams within the Survey Area do not meet habitat requirements for these species. White heelsplitters can be found in a variety of freshwater settings and perennial stream within the Survey Area may provide marginal habitat for this species. Additionally, proposed solar array layouts would be designed to avoid perennial stream and their buffers. Therefore, impacts to aquatic species within the Survey Area are not expected.

4.0 CONCLUSIONS

The wood stork is federally protected under the ESA. Suitable roosting habitat for the wood stork does not exist within the Survey Area for the Project. However, suitable foraging habitat may be present near open water and large inundated wetlands. There are also large aquaculture/fish farms both north and south of the Project that may attract foraging wood storks. The Project will not affect fish farms or large open waters outside the immediate Project limits. For these reasons, the Project will have ***no effect*** on wood storks, and no further consultation is anticipated.

Only a few populations of Price's potato-bean are known to exist today because its distinct habitat requirements. Marginally suitable habitat for this plant was observed in the Survey Area. However, during surveys, no occurrences were identified within the Survey Area. Additionally, avoidance buffers will likely be places around intermittent and perennial streams and their associated riparian areas further protecting rare plants potentially inhabiting those areas. For these reasons, the Project will have ***no effect*** on Price's potato-bean, and no further consultation is anticipated.

Suitable roosting and foraging habitat for the NLEB was identified within the Survey Area. Based on preliminary designs, the Project is expected to result in up to 368 acres of forest clearing within an area identified as potentially suitable roosting habitat. Appendix B contains a figure that depicts potentially suitable NLEB roosting and foraging habitat as well as the specific area proposed for tree clearing. However, acoustic surveys were conducted at 11 sites (a total of 26 detector-nights) within the Survey Area in accordance with USFWS Guidelines (Appendix D). NLEB was determined to be likely absent based on automated identification results. Therefore, the Project is expected to have ***no effect*** to the northern long-eared bat.

According to the Mississippi Natural Heritage Program results, one state-listed species, the federally threatened wood stork, and 15 state ranked species of special concern have potential to occur within the Survey Area. Furthermore, MDWFP concluded that if best management practices are properly implemented, monitored, and maintained, the proposed project will have ***no effect*** to state protected species or their habitats.

Based on the natural heritage data provided by TVA, an osprey, and occurrences of 28 rare plants, and twelve aquatic species, have been known to occur within three and five miles of the Survey Area, respectively. Of those species, bur oak was the only rare species to be observed during field surveys and was limited to two individuals in the southeast corner of the Survey Area. Due to their location in a perennial stream riparian zone and proximity to the parcel boundary, these trees may easily be avoided.

5.0 REFERENCES

Chafin, Linda G. 2007. Field Guide to Rare Plants of Georgia. State Botanical Garden of Georgia, Athens, Georgia.

Cornell University 2019a. The Cornell Lab. All About Birds. Wood Stork Life History. https://www.allaboutbirds.org/guide/Wood_Stork/lifehistory.Accessed March 1, 2021

Cornell University 2019b. The Cornell Lab. All About Birds. Painted Bunting Life History. https://www.allaboutbirds.org/guide/Painted_Bunting/lifehistory. Accessed April 27, 2021.

Cornell University 2019c. The Cornell Lab. All About Birds. Scissor-tailed flycatcher Life History. https://www.allaboutbirds.org/guide/Scissor-tailed_flycatcher/lifehistory. Accessed April 27, 2021.

Cornell University 2019d. The Cornell Lab. All About Birds. American Kestrel Life History. https://www.allaboutbirds.org/guide/American_Kestrel/lifehistory. Accessed October 21, 2020.

Cornell University 2019e. The Cornell Lab. All About Birds. Osprey Life History. https://www.allaboutbirds.org/guide/Osprey/lifehistory. Accessed April 27, 2021.

Cornell University. 2019b. The Cornell Lab. All About Birds. Lesser Yellowlegs Life History. https://www.allaboutbirds.org/guide/Lesser_Yellowlegs/lifehistory. Accessed October 20, 2020.

Cornell University 2019c. The Cornell Lab. All About Birds. Marbled Godwit Life History. https://www.allaboutbirds.org/guide/Marbled_Godwit/lifehistory. Accessed October 20, 2020.

Cornell University 2019d. The Cornell Lab. All About Birds. Red-headed Woodpecker Life History. https://www.allaboutbirds.org/guide/Red-headed_Woodpecker/lifehistory. Accessed October 20, 2020.

Cornell University 2019e. The Cornell Lab. All About Birds. Rusty Blackbird Life History. https://www.allaboutbirds.org/guide/Rusty_Blackbird/lifehistory. Accessed October 20, 2020.

Cornell University 2019f. The Cornell Lab. All About Birds. Short-billed Dowitcher Life History. https://www.allaboutbirds.org/guide/Short-billed_Dowitcher/lifehistory. Accessed October 20, 2020.

Cornell University 2020g. The Cornell Lab. All About Birds. Willet Life History. https://www.allaboutbirds.org/guide/Willet/lifehistory. Accessed October 20, 2020.

Flora of North America (FNA). 2020. *Carex microdonta*. www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357334. Accessed August 31, 2020.

Hilty, John. 2018. Illinois Wildflowers: Prairie Parsely (*Polytaenia nuttallii*). https://www.illinoiswildflowers.info/prairie/plantx/pr_parsley.html. Accessed April 26, 2021.

Hilty, John. 2019a. Illinois Wildflowers: Mead's Sedge (*Carex meadii*). https://www.illinoiswildflowers.info/grasses/plants/mead_sedge.htm. Accessed April 26, 2021.

Hilty, John. 2020a. Illinois Wildflowers: James' Sedge (*Carex jamesii*). https://www.illinoiswildflowers.info/prairie/plantx/wild_hyacinth.htm. Accessed August 31, 2020.

Hilty, John. 2020b. Illinois Wildflowers: Ohio Buckeye (*Aesculus glabra*). https://www.illinoiswildflowers.info/trees/tree_index.htm#oh_buckeye. Accessed April 26, 2021.

Hilty, John. 2020c. Illinois Wildflowers: Wild Hyacinth (*Camassia scilloides*). https://www.illinoiswildflowers.info/prairie/plantx/wild_hyacinth.htm. Accessed August 31, 2020.

Hilty, John. 2020d. Illinois Wildflowers: Kingnut Hickory (*Carya laciniosa*). https://www.illinoiswildflowers.info/trees/plants/kn_hickory.htm. Accessed August 31, 2020.

Hilty, John. 2020e. Illinois Wildflowers: Canada Moonseed (*Menispermum canadense*). https://www.illinoiswildflowers.info/prairie/plants/canada_moonseed.htm. Accessed August 31, 2020.

Hilty, John. 2020f. Illinois Wildflowers: Heath Aster (*Symphyotrichum ericoides*). https://www.illinoiswildflowers.info/prairie/plantx/hth_asterx.htm. Accessed August 31, 2020.

Minnesota Wildflowers. 2021. A Field Guide to Flora of Minnesota: Great Plains Ladies' tresses (*Spiranthes magnicamporum*). https://www.minnesotawildflowers.info/flower/great-plains-ladies-tresses. Accessed April 27, 2021.

Minnesota Department of Natural Resources. 2021. Species Profile: *Cycleptus elongatus*. https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AFCJC04010. Accessed December 7, 2021.

Minnesota Department of Natural Resources. 2021. Species Profile: *Crystallaria asprella*. https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AFCQC01010. Accessed December 7, 2021. Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, MS. https://www.mdwfp.com/media/256526/endangered_species_of_mississippi.pdf.

Mississippi Natural Heritage Program. 2018. Listed Species of Mississippi. Museum of Natural Science, Mississippi Dept. of Wildlife, Fisheries, and Parks, Jackson, MS. 6 pp. 24 September 2018.

Missouri Botanical Garden. 2020a. Plant Finder: *Fraxinus profunda*. www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=c987. Accessed August 31, 2020.

Missouri Botanical Garden. 2020b. Plant Finder. *Quercus macrocarpa*. https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a902. Accessed August 31, 2020.

Missouri Department of Conservation (MDC). 2020. Discover Nature: Field Guide. Celestial Lily (*Nemastylis geminiflora*). https://nature.mdc.mo.gov/discover-nature/field-guide/celestial-lily. Accessed August 31, 2020

Missouri Department of Conservation (MDC). 2021. Discover Nature: Field Guide. Eastern Spotted Skunk (*Spilogale putorius*). https://nature.mdc.mo.gov/discover-nature/field-guide/eastern-spotted-skunk. Accessed April 25, 2021.

Montana Natural Heritage Program. 2021. Big-head Evax *Evax Prolifera.* Montanta Field Guide. http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=PDAST3S050. Accessed. April 27, 2021.

NatureServeExplorer. 2021a. Cylinder Elimia (*Elimia cylindrica*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.113362/Elimia_cylindracea. Accessed December 7, 2021.

NatureServeExplorer. 2021b. Flat Pigtoe (*Pleurobema marshalli*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.114612/Pleurobema_marshalli. Accessed December 7, 2021.

NatureServeExplorer. 2021c. Freckled Darter (*Percina lenticula*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.116207/Pleurobema_taitianum. Accessed December 7, 2021.

NatureServeExplorer. 2021d. Heavy Pigtoe (*Pleurobema taitianum*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.101698/Percina_lenticula. Accessed December 7, 2021.

NatureServeExplorer. 2021e. Southern Clubshell (*Pleurobema decisum*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.1066298/Pleurobema_decisum. Accessed December 7, 2021.

NatureServeExplorer. 2021f. Southern Combshell (*Epioblasma penita*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.109895/Epioblasma_penita. Accessed December 7, 2021.

NatureServeExplorer. 2021g. Stirrupshell (*Quadrula stapes*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.107836/Theliderma_stapes. Accessed December 7, 2021.

NatureServeExplorer. 2021h. Striped Bass (*Morone saxatilis*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.104731/Morone_saxatilis. Accessed December 7, 2021.

NatureServeExplorer. 2021h. White Heelsplitter (*Lasmigona compressa*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.111988/Lasmigona_compressa. Accessed December 7, 2021.

New York Natural Heritage Program. 2021. Online Conservation Guide for *Carya laciniosa*. Available from: https://guides.nynhp.org/big-shellbark-hickory/. Accessed April 26, 2021.

Plants for a Future Database (PFAF). 2021. Nutmeg Hickory (*Carya myristiciformes*). https://pfaf.org/user/Plant.aspx?LatinName=Carya+myristiciformis. Accessed April 26, 2021.

U.S. Forest Service (USFS) 2021. Fire Effects Information System (FEIS): *Quercus macrocarpa*. https://www.fs.fed.us/database/feis/plants/tree/quemac/all.html. Accessed April 26, 2021.

University of Texas Austin. 2018. Thelesperma filifolium (Stiff Greenhead). Native Plants of North America. Lady Bird Johnson Wildflower Center. https://www.wildflower.org/plants/result.php?id_plant=thfi. Accessed April 26, 2021.

U.S. Fish and Wildlife Service (USFWS). 2019. Range-wide Indiana Bat Survey Guidelines. April 2019. Available via the internet at: https://www.fws.gov/arkansas-es/docs/FINAL%202019%20Range-wide%20IBat%20Survey%20Guidelines%204.10.19.pdf

U.S. Fish and Wildlife Service (USFWS). 2020b. Midwest Endangered Species: C

U.S. Fish and Wildlife Service (USFWS) 2020. Frecklebelly Madtom (*Noturus munitus*). https://www.fws.gov/southeast/wildlife/fishes/frecklebelly-madtom/. Accessed December 7, 2021

U.S. Fish and Wildlife Service (USFWS). 2021a. IPaC Report for Golden Triangle Solar Project. Mississippi Ecological Services Field Office. Jackson, MS. April 23, 2020.

U.S. Fish and Wildlife Service (USFWS). 2021b. Mitchell's Satyr Butterfly Fact Sheet. https://www.fws.gov/midwest/endangered/insects/misa/misa_fctsht.html. Accessed December 6, 2021.

U.S. Forest Service. 2020. Plant of the Week: Indian Paintbrush (*Castilleja coccinea*). https://www.fs.fed.us/wildflowers/plant-of-the-week/Castilleja-coccinea.shtml. Accessed August 31, 2020.

U.S. Geological Survey (USGS). 2020. Plants of Louisiana *Agalinis oligophylla*. https://warcapps.usgs.gov/PlantID/Species/Details/1985. Accessed October 21, 2020.

Wisconsin Department of Natural Resources. 2020. Slender Sedge *Carex gracilescens*. https://dnr.wi.gov/topic/EndangeredResources/Plants.asp?mode=detail&SpecCode=PMCYP035C0. Accessed April 28, 2021.

APPENDIX A - PROTECTED SPECIES INFORMATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mississippi Ecological Services Field Office
6578 Dogwood View Parkway, Suite A
Jackson, MS 39213-7856
Phone: (601) 965-4900 Fax: (601) 965-4340
http://www.fws.gov/mississippiES/endsp.html

In Reply Refer To: April 20, 2021
Consultation Code: 04EM1000-2021-SLI-0745
Event Code: 04EM1000-2021-E-01680
Project Name: Golden Triangle II

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office. Submit consultation requests electronically to the following email: msfosection7consultation@fws.gov

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Mississippi Ecological Services Field Office
6578 Dogwood View Parkway, Suite A
Jackson, MS 39213-7856
(601) 965-4900

Project Summary

Consultation Code: 04EM1000-2021-SLI-0745
Event Code: 04EM1000-2021-E-01680
Project Name: Golden Triangle II
Project Type: POWER GENERATION
Project Description: Site Evaluation for Solar Farm
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.3930148,-88.59959158688966,14z



Counties: Lowndes County, Mississippi

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Wood Stork *Mycteria americana* Population: AL, FL, GA, MS, NC, SC No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8477	Threatened

Flowering Plants

NAME	STATUS
Prices Potato-bean *Apios priceana* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7422	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO FWS MIGRATORY BIRDS OF CONCERN WITHIN THE VICINITY OF YOUR PROJECT AREA.

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical

Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

Mississippi
Department of Wildlife, Fisheries, and Parks

Sam Polles, Ph.D.
Executive Director

March 18, 2021

Burns and McDonnell
3650 Mansell Road
Suite 300
Atlanta , GA 30022

Re: Golden Triangle Solar Project - Phase II
Lowndes County, MS

Project #
Internal Id 1708

To Jesse Brown:

In response to your request for information dated **February 25, 2021**, we have searched our database for occurrences of state or federally listed species and species of special concern that occur within 2 miles of the site of the proposed project. Please find our concerns and recommendations below.

The following species of concern may occur within 2 miles of the proposed project area:

Scientific Name	Common Name	Federal Status	State Status	State Rank
Evax prolifera	Big-head Evax			S1
Spilogale putorius	Eastern Spotted Skunk			S1
Carex gracilescens	Slender Sedge			S1
Thelesperma filifolium	Stiff Greenthread			S1
Tyrannus forficatus	Scissor-tailed Flycatcher			S1B,S1N
Carex jamesii	Nebraska Sedge			S1S2
Carya laciniosa	Big Shellbark Hickory			S2
Quercus macrocarpa	Bur Oak			S2

Scientific Name	Common Name	Federal Status	State Status	State Rank
Aesculus glabra	Ohio Buckeye			S2
Polytaenia nuttallii	Prairie Parsley			S2
Nemastylis geminiflora	Prairie Pleatleaf			S2
Mycteria americana	Wood Stork	LT	LE	S2N
Carex microdonta	Small-toothed Sedge			S3
Passerina ciris	Painted Bunting			S3B
Carex meadii	Mead's Sedge			S3S4
Carya myristiciformis	Nutmeg Hickory			S3S4

State Rank
S1 - Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or vey few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
S2 - Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
S3 - Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences).

State and Federal Status
LE Endangered - A species which is in danger of extinction throughout all or a significant portion of its range.
LT Threatened - A species likely to become endangered in foreseeable future throughout all or a significant portion of its range.

Based on the information provided, we conclude that if best management practices are properly implemented, monitored, and maintained (particularly measures to prevent, or at least, minimize negative impacts to water quality), the proposed project likely poses no threat to listed species or their habitats.

Recommendations:
As listed above, there are 16 species of concern in our database within a 2-mile radius of the proposed Golden Triangle Solar Project in Lowndes County, MS (33.385400, -88.620229). Of the 16 species listed, the Wood Stork is listed as federally threaten and state endangered. Many of the listed species are on the decline because of degradation or destruction of essential habitat needed to support them. Concerns for this project is the potential for sediment and pollutants to enter nearby into nearby bodies of water, such as North Branch Magowah Creek. Activities that modify the landscape can be detrimental because they can adversely affect water quality by increasing herbicide and pesticide load, silt load, exhaust runoff from roads, and other unintentional pollutants. These factors may negatively impact habitat conditions by detrimentally affecting respiration, feeding, and reproduction of amphibians, bats, birds, crayfishes, fishes, insects, turtles, and vegetation. Wood Storks inhabit freshwater wetlands and require receding water levels and concentrations of fish. Wood Stork populations have declined throughout its range because of habitat alteration from the construction of canals, levees, and other such structures that have interfered with normal water cycles. Portions within or adjacent to the boundaries of this project site are underlain by hydric soils and may be designated wetlands. If this project is approved, we ask that serious consideration be given to the cumulative impacts of wetland disturbance and elimination, and that appropriate, in-kind mitigation be provided. We recommend that best management practices such as streamside management zones (SMZs) be properly implemented, monitored, and maintained for compliance, specifically measures that will prevent suspended silt and contaminants from leaving the site in storm water run-off as this may negatively affect water quality and habitat conditions within nearby streams and waterbodies (https://www.mfc.ms.gov/forest-health/water-quality-and-forestry-best-management-practices/). If possible, we ask to

leave the trees on the boundaries of streams and the outlined property, as they can act as corridors for wildlife and erosion control.

Please feel free to contact us if we can provide any additional infromation, resources, or assistance that will help minimize negative impacts to the species and/or ecological communities identified in this review. We are happy to work with you to ensure that our state's precious natural heritage is conserved and preserved for future Mississippians.

Completed by Quentin Fairchild

The Mississippi Natural Heritage Program (MNHP) has compiled a database that is the most complete source of information about Mississippi's rare, threatened, and endangered plants, animals, and ecological communities. The quantity and quality of data collected by MNHP are dependent on the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific field surveys; most natural areas in Mississippi have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Heritage reports summarize the existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement on the presence, absence or condition of biological elements on a particular site.

APPENDIX B - MAPS AND FIGURES

Artesia Rd
Sessums Rd
Artesia
Artesia Rd
Artesia Rd
Airport Rd
Highway 45 South Alternate
Gilmer Creek
Gilmer Creek
Highway 45 S
Catalpa Creek
Red Bud Creek
Oktibbeha
Lowndes
North Branch Magowah Creek
North Branch Magowah Creek
Magowah Creek
South Branch Magowah Creek
S Highway 45 Alternate
Rocky Bottom Creek
Carson Rd
Robinson Rd
Moor High Rd
Cedar Creek
45
788
789

Arkansas
Georgia
Project Location
Mississippi
Alabama
Birmingham

Survey Corridor

NORTH
1 0.5 0 1
Miles

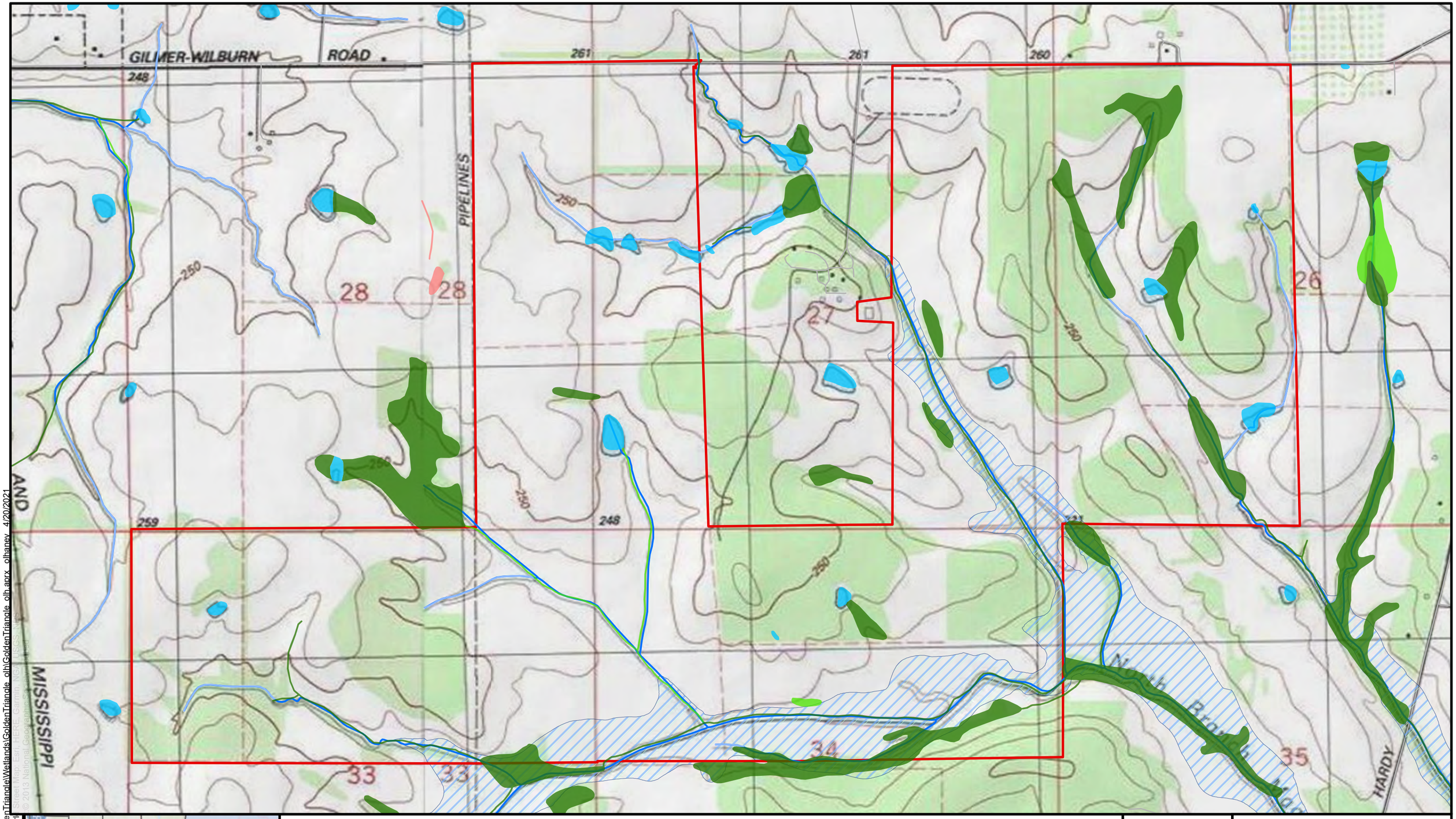
BURNS McDONNELL

Figure A-1
General Vicinity Map
Golden Triangle Phase II
Lowndes County, MS

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/20/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, Origis, Burns & McDonnell

Issued: 4/20/2021





Survey Corridor
100-Year Floodplain
NHD Flowline

NWI Wetlands
PFO
PEM
PSS
PAB
PUB
Lake
Riverine

NORTH
0 500 1,000
Scale in Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, and Topographic Map
Golden Triangle Phase II
Lowndes County, MS

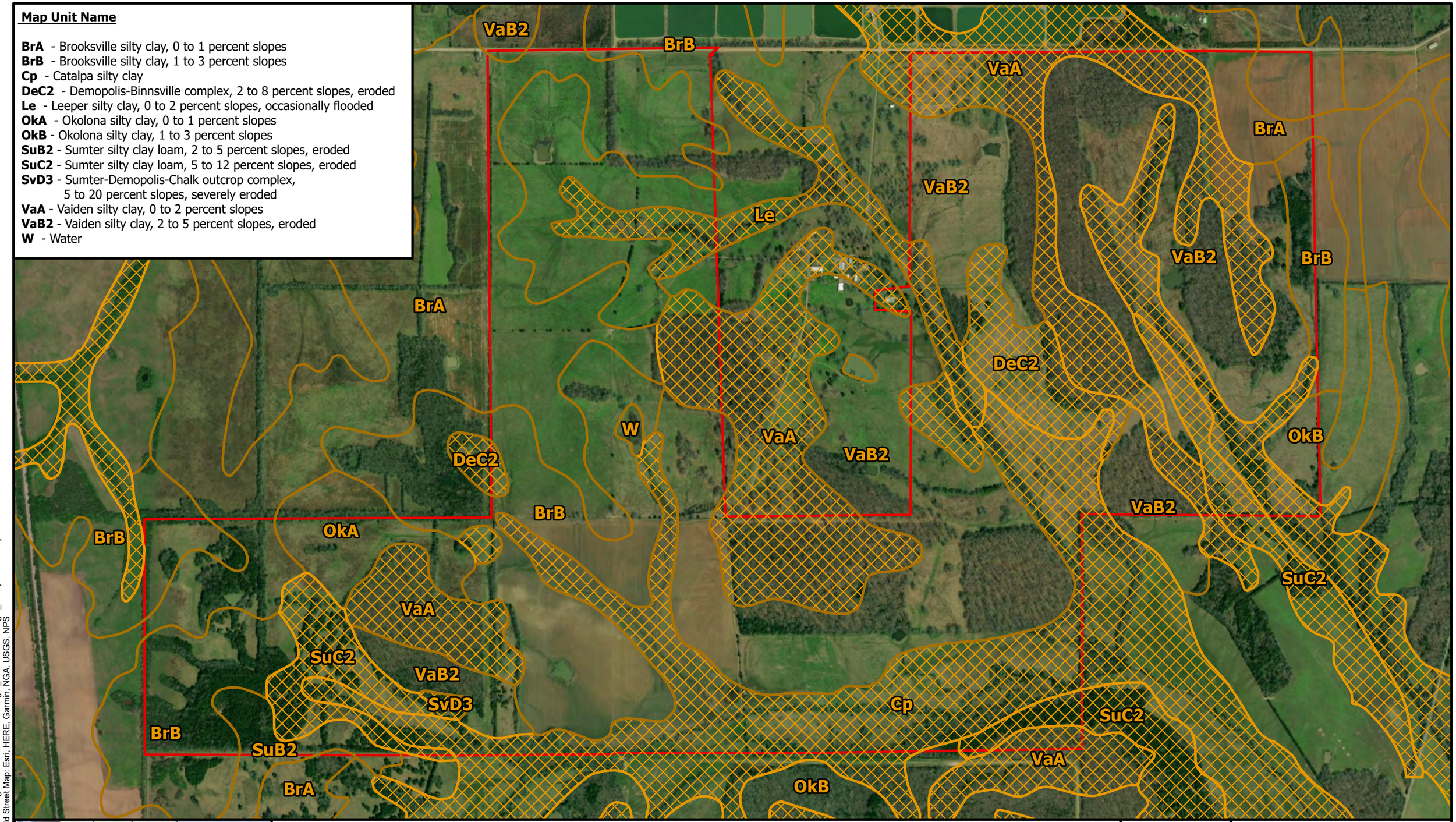
Issued: 4/20/2021

Source: Esri, NHD, NWI, FEMA, Origis, Burns & McDonnell

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhanev 4/20/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, INCREMENT P, © 2013 National Geographic Society, i-cubed

Map Unit Name

BrA - Brooksville silty clay, 0 to 1 percent slopes
BrB - Brooksville silty clay, 1 to 3 percent slopes
Cp - Catalpa silty clay
DeC2 - Demopolis-Binnsville complex, 2 to 8 percent slopes, eroded
Le - Leeper silty clay, 0 to 2 percent slopes, occasionally flooded
OkA - Okolona silty clay, 0 to 1 percent slopes
OkB - Okolona silty clay, 1 to 3 percent slopes
SuB2 - Sumter silty clay loam, 2 to 5 percent slopes, eroded
SuC2 - Sumter silty clay loam, 5 to 12 percent slopes, eroded
SvD3 - Sumter-Demopolis-Chalk outcrop complex, 5 to 20 percent slopes, severely eroded
VaA - Vaiden silty clay, 0 to 2 percent slopes
VaB2 - Vaiden silty clay, 2 to 5 percent slopes, eroded
W - Water





Survey Corridor
Non-Hydric Soil
Hydric Soil

NORTH
0 500 1,000
Scale in Feet

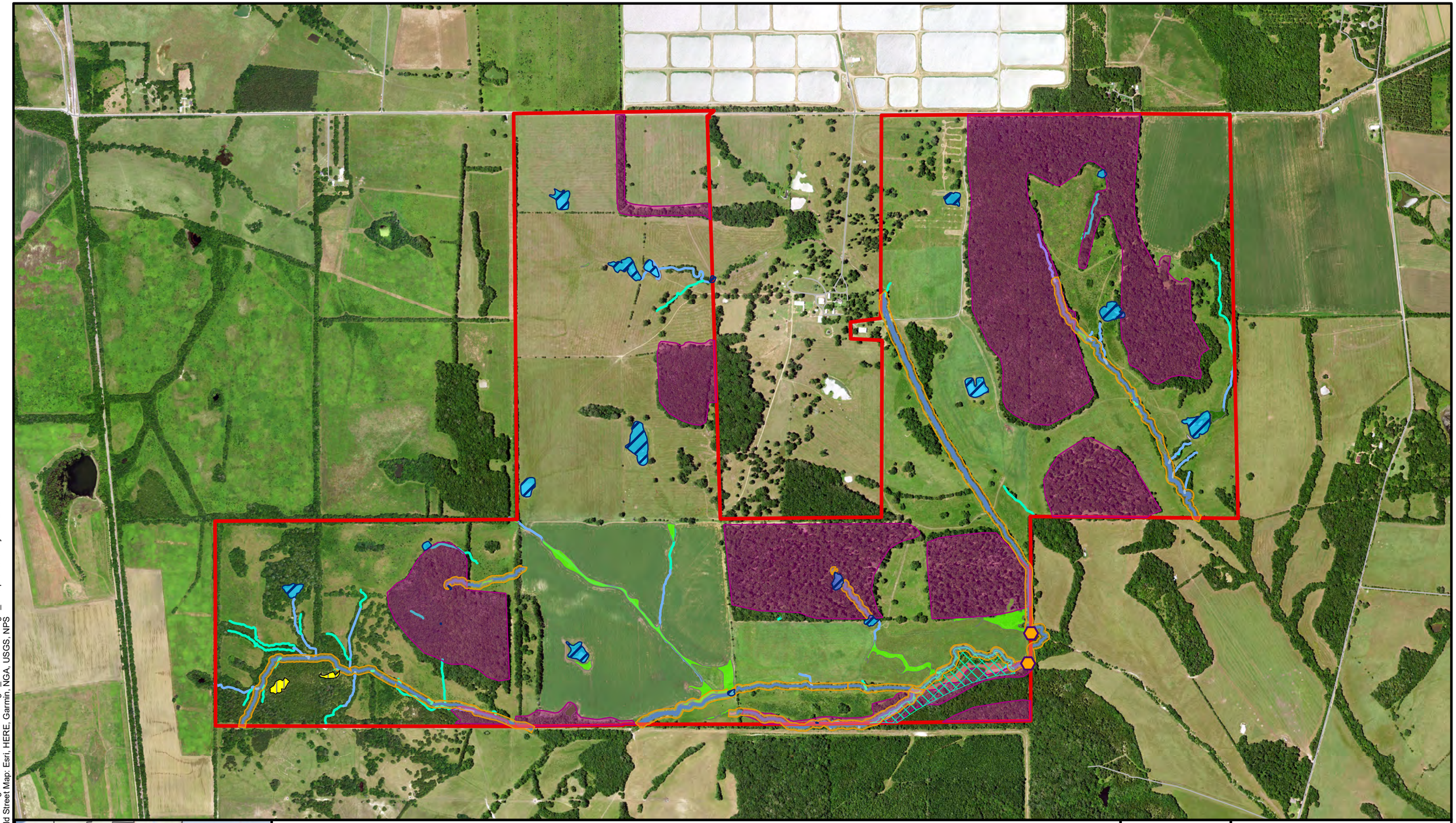
BURNS McDONNELL

Figure A-3
NRCS Soils Map
Golden Triangle Phase II
Lowndes County, MS

Path: C:\ZZ_Projects\GoldenTriangleWetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/20/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, Origis, Burns & McDonnell

Issued: 4/20/2021

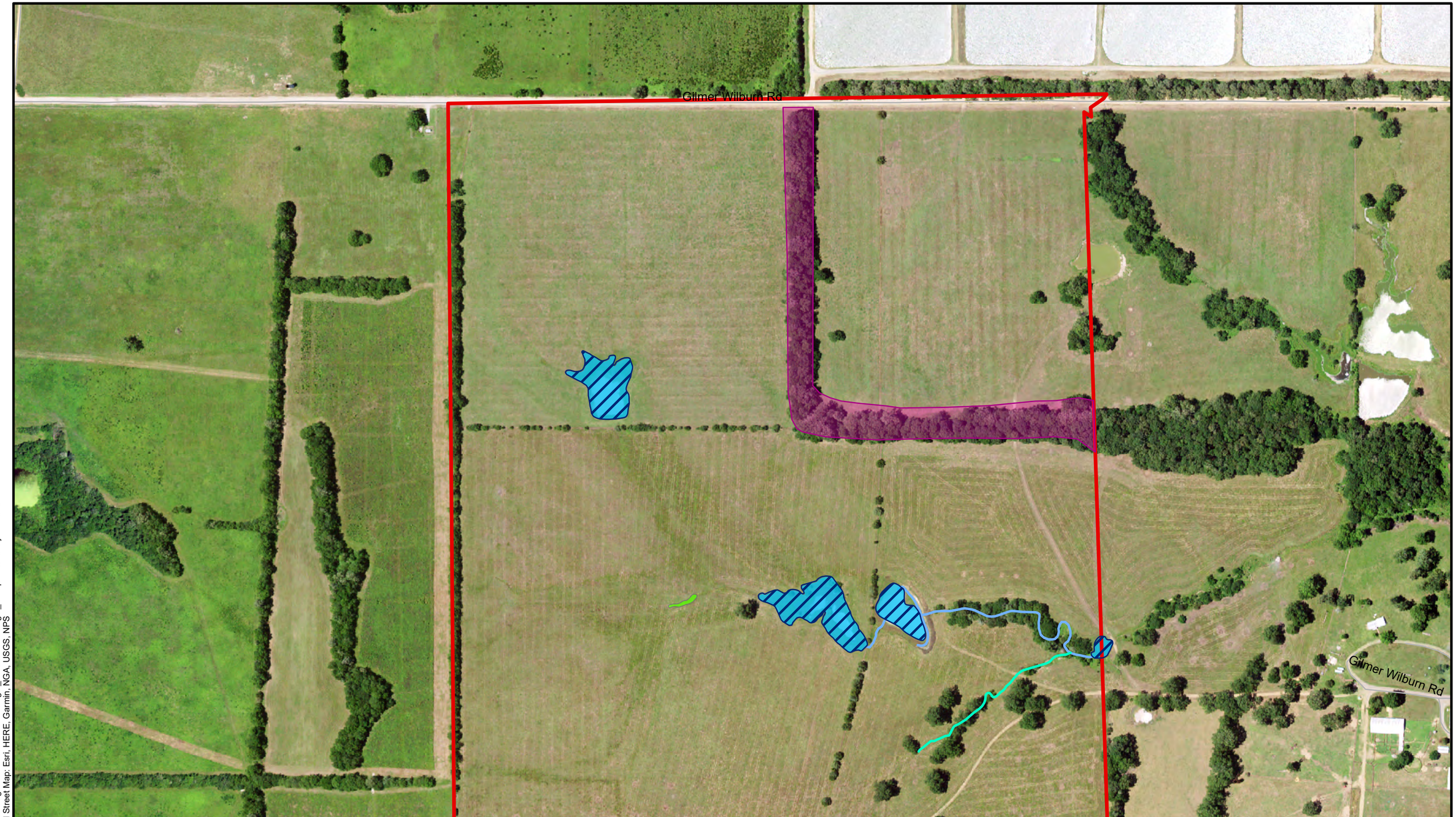


Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, Origis, Burns & McDonnell

Issued: 4/28/2021





Survey Corridor
Streets

Delineated Wetlands
PEM

PUB

Delineated Streams
Ephemeral
Intermittent

Potential Wood Stork Foraging Habitat
Potential NLEB Roosting Habitat

NORTH
0 200 400
Scale in Feet

BURNS McDONNELL

Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS
Page 1 of 7

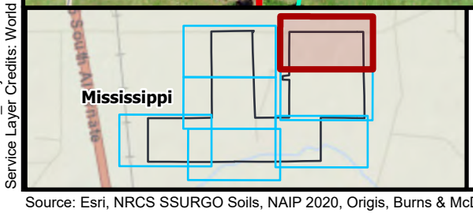
Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, NAIP 2020, Origis, Burns & McDonnell

Issued: 4/28/2021

Gilmer Wilburn Rd

Gilmer Wilburn Rd



Survey Corridor
Streets

Delineated Wetlands
PFO
PUB

Delineated Streams
Ephemeral
Intermittent
Perennial

Potential Wood Stork Foraging Habitat
Potential NLEB Foraging Habitat
Potential NLEB Roosting Habitat

NORTH
0 200 400
Scale in Feet

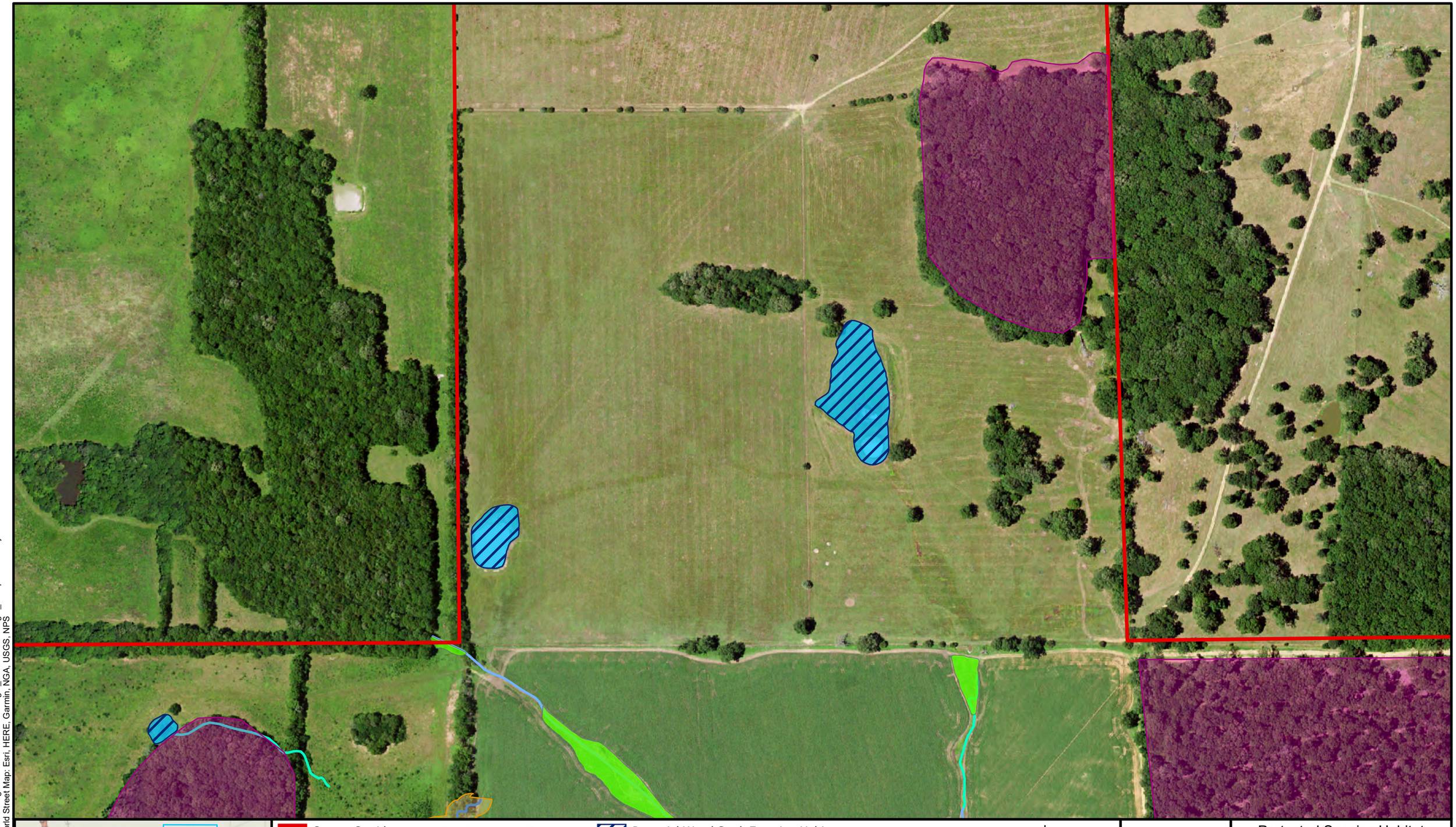
BURNS McDONNELL

Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS
Page 2 of 7

Issued: 4/28/2021

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, NAIP 2020, Origis, Burns & McDonnell



BURNS McDONNELL

Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS
Page 3 of 7

Path: C:\ZZ_Projects\GoldenTriangleWetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, NAIP 2020, Origis, Burns & McDonnell

Issued: 4/28/2021

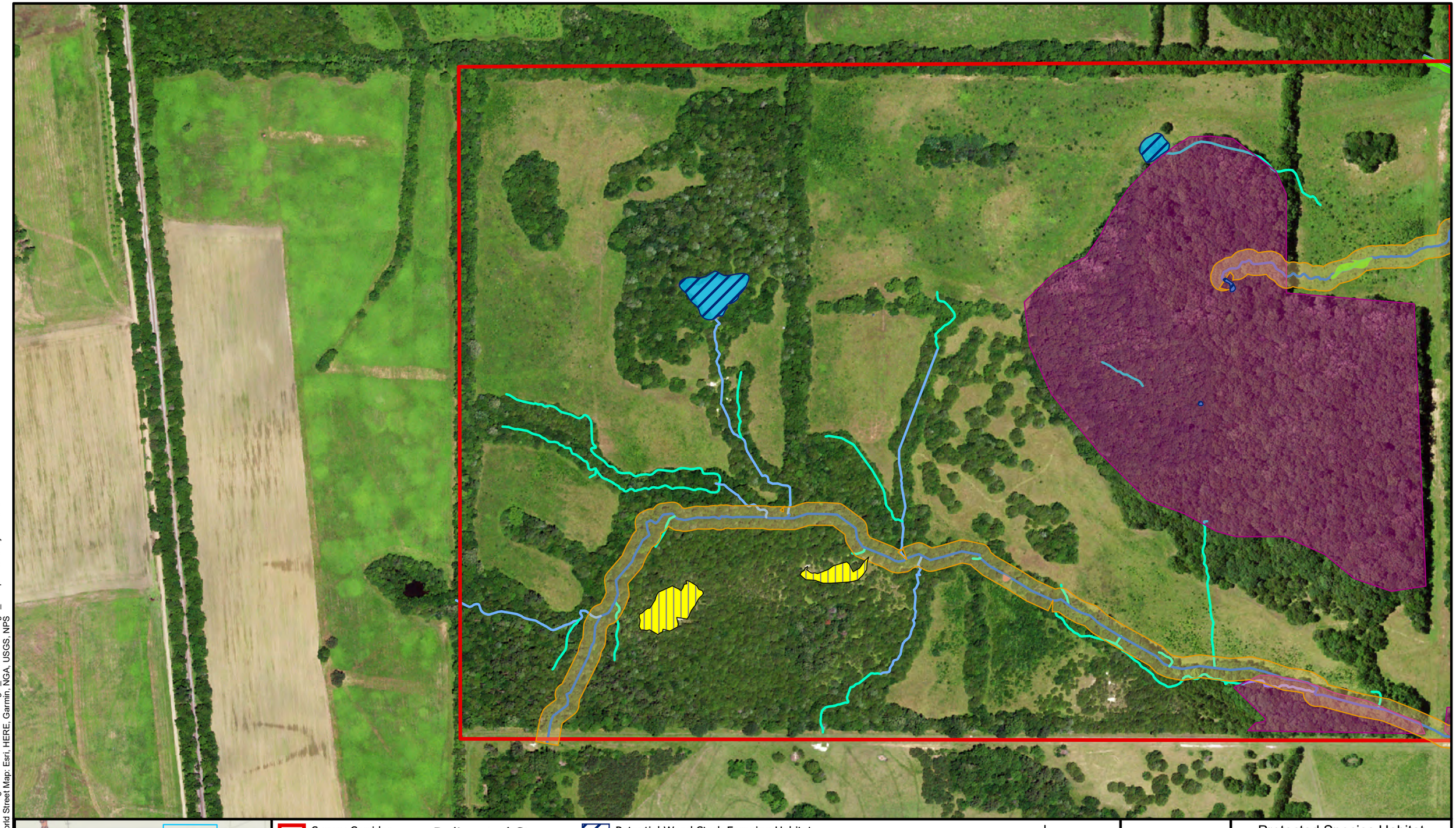


Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS
Page 4 of 7

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, NAIP 2020, Origis, Burns & McDonnell

Issued: 4/28/2021



Survey Corridor

Delineated Wetlands
- PEM
- PSS
- PUB

Delineated Streams
- Ephemeral
- Intermittent
- Perennial
- Chalk Outcrop

- Potential Wood Stork Foraging Habitat
- Potential NLEB Foraging Habitat
- Potential NLEB Roosting Habitat

NORTH

0 200 400

Scale in Feet

BURNS McDONNELL

Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS
Page 5 of 7

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, NAIP 2020, Origis, Burns & McDonnell

Issued: 4/28/2021

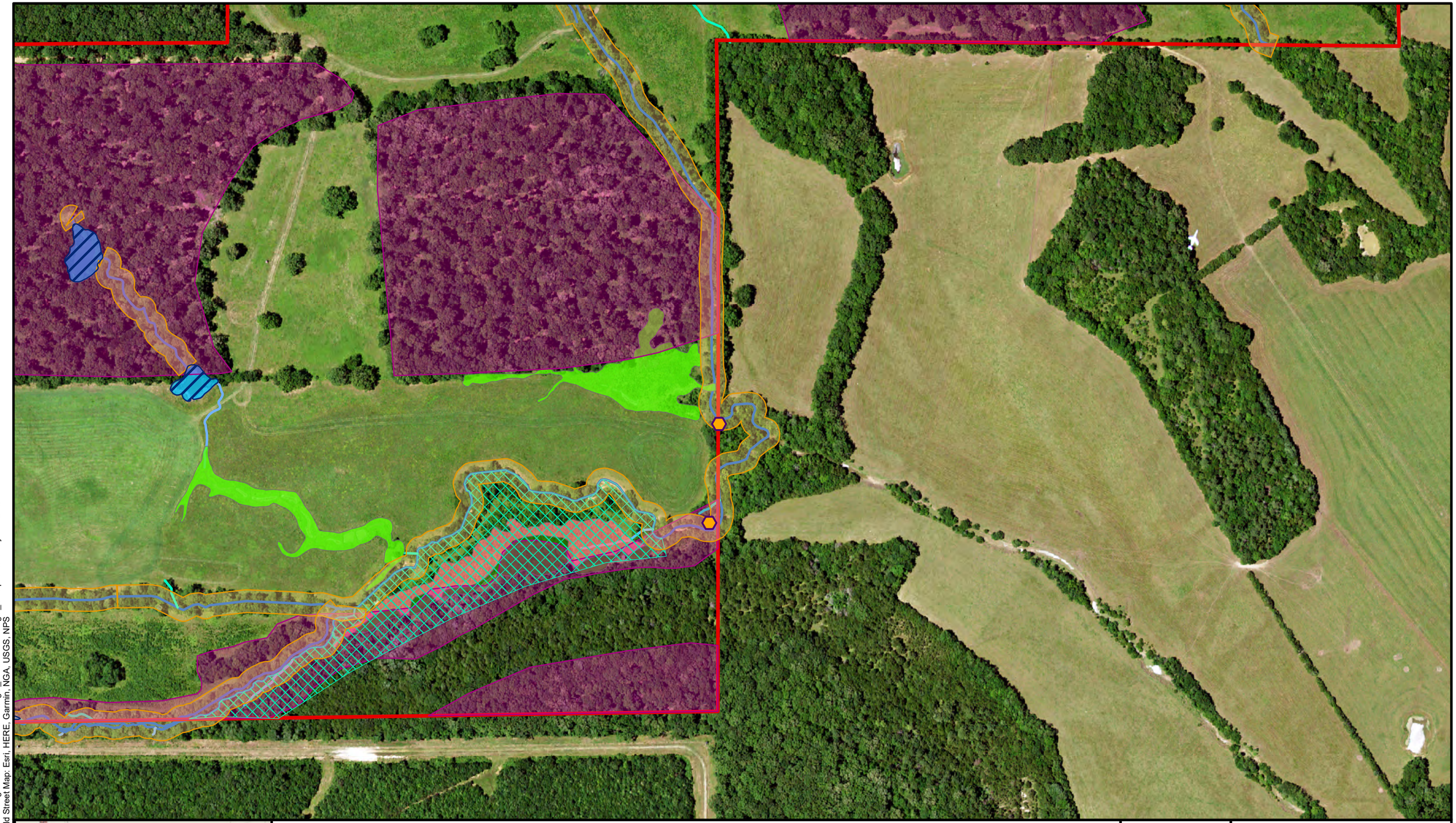


Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS
Page 6 of 7

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, NAIP 2020, Origis, Burns & McDonnell

Issued: 4/28/2021



BURNS McDONNELL

Protected Species Habitat Assessment Map
Golden Triangle Phase II
March 2021
Lowndes County, MS
Page 7 of 7

Path: C:\ZZ_Projects\GoldenTriangle\Wetlands\GoldenTriangle_olh\GoldenTriangle_olh.aprx olhaney 4/28/2021
Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS

Source: Esri, NRCS SSURGO Soils, NAIP 2020, Origis, Burns & McDonnell

Issued: 4/28/2021

APPENDIX C - REPRESENTATIVE PHOTOGRAPHS



Photograph 1: Example of suitable bat roosting habitat within the Golden Triangle II Survey Area. Pictured: Shagbark hickories with exfoliating bark and open understory.



Photograph 2: Example of suitable bat roosting habitat within Golden Triangle II Survey Area. Pictured: Large Snag.



Photograph 3: Example of suitable roosting habitat within Golden Triangle Survey Area. Pictured: Scattered snags throughout forested areas.



Photograph 4: Example of suitable bat roosting habitat within the Golden Triangle II Survey Area. Pictured: Shagbark hickories with exfoliating bark and open understory.



Photograph 5: Example of suitable bat roosting habitat within Golden Triangle II Survey Area. Pictured: Hollow snag.



Photograph 6: Bur Oak (*Quercus macrocarpa*) observation within Golden Triangle II Survey Area.



Photograph 7: Example of bur oak acorn within Golden Triangle II Survey Area..



Photograph 8: Example of chalk outcrop within Golden Triangle II Survey Area.



Photograph 9: Representative photograph of pasture community type within Survey Area.



Photograph 10: Representative photograph of PFO wetland habitat within the Survey Area.



Photograph 11: Representative photograph of forested habitat community type within Survey Area.



Photograph 12: Representative photograph of active agriculture field habitat community type within Survey Area – between crop rotations.



Photograph 9: General representation of perennial streams within the Survey Area.



Photograph 10: General representation of intermittent streams within the Survey Area



Photograph 11: General representation of ephemeral stream features within Survey Area.



Photograph 12: General representation of PUB features within the Survey Area.



Photograph 13: General representation of PEM wetland features within the Survey Area



Photograph 14: General representation of forested area in southwest portion of Survey Area. Primarily composed of eastern red cedar; determined not suitable NLEB habitat.

APPENDIX D – ACOUSTIC BAT SURVEY REPORT

October 5, 2021

Logan Barber
Terrestrial Zoologist
Tennessee Valley Authority

Re: Acoustic Bat Survey Report for the Origis Golden Triangle 2 Solar Project in Lowndes County, Mississippi
Burns & McDonnell Project Number 131497

Dear Mr. Barber:

Burns & McDonnell has been retained by Origis Energy (Origis) to conduct environmental permitting for the Golden Triangle 2 Solar Project (Project). The initial review of protected species information for the Project indicated that potential habitat for the federally threatened northern long-eared bat (*Myotis septentrionalis*) may be impacted by the tree clearing activities (Figure A-1 in Appendix A). Based on recent discussions with the Tennessee Valley Authority (TVA) it was determined that presence/absence surveys should be conducted to assess potential occurrence of the northern long-eared bat. Accordingly, Burns & McDonnell conducted presence/absence surveys for the northern long-eared bat using acoustic methods.

METHODS

The following methods were included in a survey plan submitted to the TVA on July 29, 2021. The survey protocol followed the most current (2020) U.S. Fish and Wildlife (USFWS) *Rangewide Indiana Bat Survey Guidelines* (Guidelines). Based on the *Protected Species Habitat Assessment Report* finalized on July 6, 2021, approximately 358 acres of potential northern long-eared bat roosting habitat occurs within the Project area. The level of effort specified in the Guidelines for nonlinear projects is 8 detector-nights per 123 acres (or less) of habitat. Therefore, the required level of survey effort on this Project is 24 detector-nights.

The locations of the deployed detectors were determined in the field and based on site conditions by qualified bat biologists (Appendix D). Areas of suitable roosting habitat and proposed acoustic sites are shown in Figure A-1. A total of 11 sites were surveyed. Habitat types sampled included corridors, field/forest edges, ponds, and streams. Forested habitat in the vicinity of the sites were generally dominated by white oak (*Quercus alba*), southern red oak (*Quercus falcata*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), mockernut hickory (*Carya tomentosa*), water hickory (*Carya aquatica*), willow oak (*Quercus phellos*), cherrybark oak (*Quercus pagoda*), swamp chestnut oak (*Quercus michauxii*), green ash (*Fraxinus pennsylvanica*), box elder (*Acer negundo*), and red maple *(Acer rubrum*). Fields near the sample sites were in an early successional state due to crop growth/harvesting, and regular management/mowing as well as repeated cattle grazing. Corn is planted in late spring and covers the row crop fields on approximately 125 acres.

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

Wildlife Acoustics SM2BAT, SM3BAT, and SM4FS acoustic detectors (detectors) with omnidirectional microphones were used to survey the Project area. One detector was placed at each site and a total of 11 sites were sampled, (Table 1; Appendix B - Photographs). Microphones were positioned at least 3 meters from obstructions and with minimal clutter within 10 meters. The detectors were set to record from 30 minutes before sunset to 30 minutes after sunrise. Recordings were collected in full spectrum, with settings optimized for detection of northern long-eared bat (Table 1). Cable connections and settings were carefully assessed in the field to determine the detector would be operating properly.

Table 1: Key settings for the acoustic detectors used for acoustic bat surveys.

Setting Type	Setting*
Detector model	Wildlife Acoustics SM2BAT, SM3BAT, or SM4FS
Nightly recording time	0.5 hours before sunset to 0.5 hours after sunrise
Recording format	Full-spectrum .wav
Sample frequency	384 kHz
Minimum trigger frequency	16 kHz
Trigger level	12 dB
Trigger window	3 seconds

*All other settings used default values for recording bats.

Bat calls were classified to species using Kaleidoscope Pro with the Bats of North America classifier version 5.4.0 with a 0 (neutral) setting. If Kaleidoscope indicated likely presence ($p < 0.05$) of northern long-eared bat, all bat calls from that sight and night would be reviewed manually by Josiah Maine. Call characteristics would be compared to known representative calls and known call parameters to determine species.

RESULTS

Detectors were placed at sites 1, 2, 3, 4, and 5 on August 3, 2021, and were retrieved on August 5, 2021 (Table 2). Detectors were placed at sites 6, 7, 8, and 9 on August 4, 2021, and retrieved on August 6, 2021. At sites 10 and 11, detectors were placed on August 5, 2021, and retrieved on August 10, 2021. Weather during the survey period included temperatures ranging from 66 degrees Fahrenheit to 86 degrees Fahrenheit, wind speeds of 3 to 10 miles per hour, and no precipitation. Winds did not exceed 9 miles per hour for more than 30 minutes (Table C-12 in Appendix C); therefore, weather conditions were within the bounds of the USFWS Guidelines. Detectors generally functioned properly, except at site 11, where the acoustic data exceeded the

card capacity the evening of August 8. At 26 complete detector-nights, the level of survey effort was sufficient to meet the requirements of the Guidelines.

Table 2: Acoustic survey site coordinates and habitat.

Site	Detector-nights	Lat	Long	Habitat
1	2	33.4016513	-88.6010734	Corridor/forest edge
2	2	33.4019296	-88.5983261	Field/forest edge by pond
3	2	33.3979317	-88.5953295	Forest opening
4	2	33.3920261	-88.5993483	Field/forest edge
5	2	33.3890347	-88.6055889	Field/forest edge
6	2	33.3934448	-88.6147555	Corridor/forest opening
7	2	33.3891569	-88.6144079	Field/forest edge
8	2	33.3871545	-88.6250538	Field/forest edge
9	2	33.3825378	-88.6225526	Field/forest edge
10	5	33.3843164	-88.6017695	Field/forest edge by stream
11	3	33.3835537	-88.607802	Field/forest edge

Across the 11 sites, 9 species were determined to be present by the Kaleidoscope Pro classifier: big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), Seminole bat (*Lasiurus seminolus*), little brown bat (*Myotis lucifugus*), southeastern bat (*Myotis austroriparius*), tricolored bat (*Perimyotis subflavus*), evening bat (*Nycticeius humeralis*), and Mexican free-tailed bat (*Tadarida brasiliensis*). No threatened or endangered species were determined present at any of the sites; therefore, qualitative analysis (manual review) was not necessary. Data tables with detailed analysis results for each site are included in Appendix C.

CONCLUSION

Acoustic surveys were conducted at 11 sites (a total of 26 detector-nights) for the Project, in accordance with USFWS Guidelines. Northern long-eared bat was determined to be likely absent based on automated identification results. Therefore, impacts to northern long-eared bat from implementation of this Project are not anticipated.

If you have any questions or comments regarding this bat study plan, please contact me by phone at 816-448-7519 or by email at jjmaine@burnsmcd.com.

Sincerely,



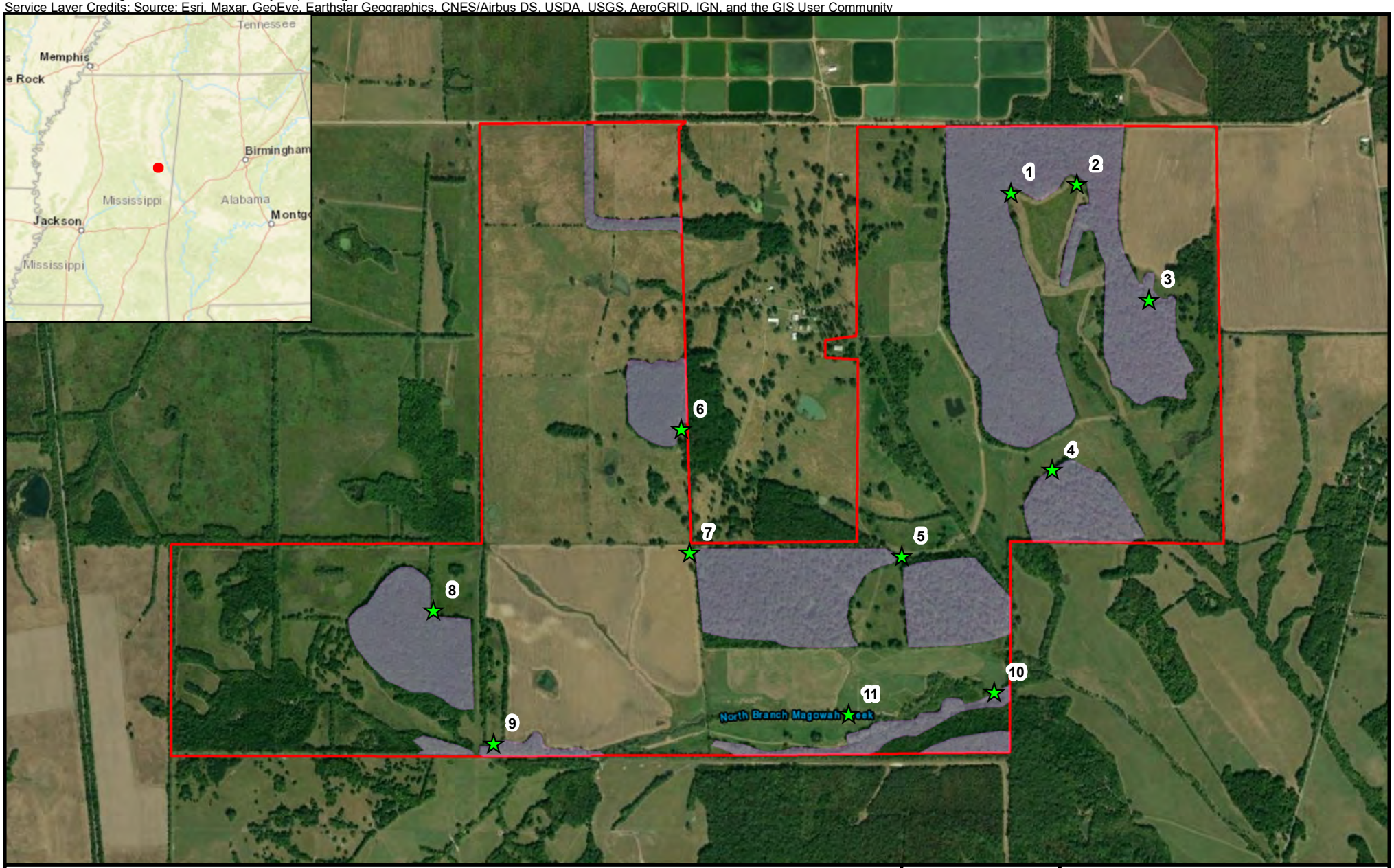
Josiah Maine
Environmental Scientist

Attachments:

- Appendix A - Figures
- Appendix B - Acoustic Survey Photographs
- Appendix C - Data Tables

APPENDIX A - FIGURES

Path: C:\GIS\GT2\Figure A-1 GT2 NLEB Survey Map.mxd jjmaine 9/22/2021
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Acoustic Site

Northern Long-eared Bat Roosting Habitat

Golden Triangle 2 Boundary

NORTH

2,000 1,000 0 2,000

Scale in Feet

BURNS McDONNELL

Figure A-1
Acoustic Survey Map
Golden Triangle 2 Solar Project
Lowndes County, Mississippi

Source:

Issued: 9/22/2021

APPENDIX B - ACOUSTIC SURVEY PHOTOGRAPHS



Photograph B-1: View of acoustic site 1, facing north.



Photograph B-2: View of acoustic site 2, facing east.



Photograph B-3: View of acoustic site 3, facing west.



Photograph B-4: View of acoustic site 4, facing east.



Photograph B-5: View of acoustic site 5, facing south.



Photograph B-6: View of acoustic site 6, facing north.



Photograph B-7: View of acoustic site 7, facing east.



Photograph B-8: View of acoustic site 8, facing southwest.



Photograph B-9: View of acoustic site 9, facing west.



Photograph B-10: View of acoustic site 10, facing south.



Photograph B-11: View of acoustic site 11, facing south.

APPENDIX C - DATA TABLES

Table C-1: Automated identification results for site 1. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	211	0
Eastern red bat	*Lasiurus borealis*	372	0
Hoary bat	*Lasiurus cinereus*	1	1
Seminole bat	*Lasiurus seminolus*	24	1
Southeastern bat	*Myotis austroriparius*	12	0
Little brown bat	*Myotis lucifugus*	135	0
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	97	1
Tricolored bat	*Perimyotis subflavus*	318	0
Mexican free-tailed bat	*Tadarida brasiliensis*	32	<0.01
Unidentified bat		927	
Noise		3181	
Total bat files		2129	

Table C-2: Automated identification results for site 2. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	257	0
Eastern red bat	*Lasiurus borealis*	665	0
Hoary bat	*Lasiurus cinereus*	5	1
Seminole bat	*Lasiurus seminolus*	35	1
Southeastern bat	*Myotis austroriparius*	5	<0.01
Little brown bat	*Myotis lucifugus*	79	0.41
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	59	1
Tricolored bat	*Perimyotis subflavus*	120	<0.01
Mexican free-tailed bat	*Tadarida brasiliensis*	133	0
Unidentified bat		791	
Noise		2943	
Total bat files		2149	

Table C-3: Automated identification results for site 3. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	73	0
Eastern red bat	*Lasiurus borealis*	135	0
Hoary bat	*Lasiurus cinereus*		1
Seminole bat	*Lasiurus seminolus*	24	1
Southeastern bat	*Myotis austroriparius*	1	0.01
Little brown bat	*Myotis lucifugus*	10	1
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	29	1
Tricolored bat	*Perimyotis subflavus*	23	0.31
Mexican free-tailed bat	*Tadarida brasiliensis*	10	0.07
Unidentified bat		277	
Noise		51	
Total bat files		582	

Table C-4: Automated identification results for site 4. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	117	0
Eastern red bat	*Lasiurus borealis*	322	0
Hoary bat	*Lasiurus cinereus*	59	0
Seminole bat	*Lasiurus seminolus*	26	1
Southeastern bat	*Myotis austroriparius*	2	0.55
Little brown bat	*Myotis lucifugus*	66	<0.01
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	76	1
Tricolored bat	*Perimyotis subflavus*	87	0
Mexican free-tailed bat	*Tadarida brasiliensis*	41	0
Unidentified bat		595	
Noise		2495	
Total bat files		1391	

Table C-5: Automated identification results for site 5. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	73	0
Eastern red bat	*Lasiurus borealis*	133	0
Hoary bat	*Lasiurus cinereus*	1	1
Seminole bat	*Lasiurus seminolus*	67	0.01
Southeastern bat	*Myotis austroriparius*		1
Little brown bat	*Myotis lucifugus*	10	1
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	15	1
Tricolored bat	*Perimyotis subflavus*	77	0
Mexican free-tailed bat	*Tadarida brasiliensis*	79	0
Unidentified bat		296	
Noise		1238	
Total bat files		751	

Table C-6: Automated identification results for site 6. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	282	0
Eastern red bat	*Lasiurus borealis*	212	0
Hoary bat	*Lasiurus cinereus*	1	1
Seminole bat	*Lasiurus seminolus*	3	1
Southeastern bat	*Myotis austroriparius*	4	<0.01
Little brown bat	*Myotis lucifugus*	49	<0.01
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	40	1
Tricolored bat	*Perimyotis subflavus*	85	0
Mexican free-tailed bat	*Tadarida brasiliensis*	3	1
Unidentified bat		260	
Noise		275	
Total bat files		939	

Table C-7: Automated identification results for site 7. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	3	0.38
Eastern red bat	*Lasiurus borealis*	2	0.13
Hoary bat	*Lasiurus cinereus*		1
Seminole bat	*Lasiurus seminolus*	2	0.60
Southeastern bat	*Myotis austroriparius*	14	0
Little brown bat	*Myotis lucifugus*	3	0.18
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*		1
Tricolored bat	*Perimyotis subflavus*	13	0
Mexican free-tailed bat	*Tadarida brasiliensis*	12	0
Unidentified bat		68	
Noise		1097	
Total bat files		117	

Table C-8: Automated identification results for site 8. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	121	0
Eastern red bat	*Lasiurus borealis*	38	0
Hoary bat	*Lasiurus cinereus*	4	1
Seminole bat	*Lasiurus seminolus*	10	0.86
Southeastern bat	*Myotis austroriparius*	2	<0.01
Little brown bat	*Myotis lucifugus*	12	0.08
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	16	1
Tricolored bat	*Perimyotis subflavus*	11	0.15
Mexican free-tailed bat	*Tadarida brasiliensis*	3	1
Unidentified bat		147	
Noise		7302	
Total bat files		364	

Table C-9: Automated identification results for site 9. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	48	0
Eastern red bat	*Lasiurus borealis*	16	0
Hoary bat	*Lasiurus cinereus*		1
Seminole bat	*Lasiurus seminolus*	1	1
Southeastern bat	*Myotis austroriparius*	3	<0.01
Little brown bat	*Myotis lucifugus*	28	0
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*		1
Tricolored bat	*Perimyotis subflavus*	4	0.34
Mexican free-tailed bat	*Tadarida brasiliensis*	1	1
Unidentified bat		75	
Noise		926	
Total bat files		176	

Table C-10: Automated identification results for site 10. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	178	0
Eastern red bat	*Lasiurus borealis*	173	0
Hoary bat	*Lasiurus cinereus*	14	0.97
Seminole bat	*Lasiurus seminolus*	78	<0.01
Southeastern bat	*Myotis austroriparius*	14	0
Little brown bat	*Myotis lucifugus*	59	<0.01
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	82	1
Tricolored bat	*Perimyotis subflavus*	163	0
Mexican free-tailed bat	*Tadarida brasiliensis*	83	0
Unidentified bat		573	
Noise		8386	
Total bat files		1417	

Table C-11: Automated identification results for site 11. MLE scores less than 0.05 indicate presence as determined by Kaleidoscope.

Common Name	Scientific Name	Files	MLE
Big brown bat	*Eptesicus fuscus*	52	0
Eastern red bat	*Lasiurus borealis*	25	0
Hoary bat	*Lasiurus cinereus*		1
Seminole bat	*Lasiurus seminolus*	14	0.58
Southeastern bat	*Myotis austroriparius*	7	0
Little brown bat	*Myotis lucifugus*	36	0
Northern long-eared bat	*Myotis septenrionalis*		1
Evening bat	*Nycticeius humeralis*	47	0.02
Tricolored bat	*Perimyotis subflavus*	43	0
Mexican free-tailed bat	*Tadarida brasiliensis*	22	0
Unidentified bat		170	
Noise		5482	
Total bat files		416	

Table C-12: Weather conditions from the Golden Triangle Regional Airport during the acoustic surveys.

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/03/2021 19:25 CDT	78.8	5.75	clear
08/03/2021 19:30 CDT	77	5.75	clear
08/03/2021 19:35 CDT	77	5.75	clear
08/03/2021 19:40 CDT	77	5.75	clear
08/03/2021 19:45 CDT	75.2	4.6	clear
08/03/2021 19:50 CDT	75.2	5.75	clear
08/03/2021 19:55 CDT	75.2	5.75	clear
08/03/2021 19:56 CDT	75.92	5.75	clear
08/03/2021 20:00 CDT	75.2	5.75	clear
08/03/2021 20:05 CDT	75.2	4.6	clear
08/03/2021 20:10 CDT	75.2	4.6	clear
08/03/2021 20:15 CDT	75.2	4.6	clear
08/03/2021 20:20 CDT	75.2	4.6	clear
08/03/2021 20:25 CDT	75.2	4.6	clear
08/03/2021 20:30 CDT	75.2	3.45	clear
08/03/2021 20:35 CDT	75.2	3.45	clear
08/03/2021 20:40 CDT	73.4	3.45	clear
08/03/2021 20:45 CDT	73.4	3.45	clear
08/03/2021 20:50 CDT	73.4	3.45	clear
08/03/2021 20:55 CDT	73.4	4.6	clear
08/03/2021 20:56 CDT	73.94	4.6	clear
08/03/2021 21:00 CDT	73.4	3.45	clear
08/03/2021 21:05 CDT	73.4	4.6	clear
08/03/2021 21:10 CDT	73.4	4.6	clear
08/03/2021 21:15 CDT	73.4	3.45	clear
08/03/2021 21:20 CDT	73.4	3.45	clear
08/03/2021 21:25 CDT	71.6	3.45	clear
08/03/2021 21:30 CDT	73.4	4.6	clear
08/03/2021 21:35 CDT	71.6	4.6	clear
08/03/2021 21:40 CDT	71.6	5.75	clear
08/03/2021 21:45 CDT	71.6	5.75	clear
08/03/2021 21:50 CDT	71.6	5.75	clear
08/03/2021 21:55 CDT	69.8	5.75	clear
08/03/2021 21:56 CDT	69.98	5.75	clear
08/03/2021 22:00 CDT	71.6	5.75	clear
08/03/2021 22:05 CDT	71.6	5.75	clear
08/03/2021 22:10 CDT	71.6	5.75	clear
08/03/2021 22:15 CDT	69.8	5.75	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/03/2021 22:20 CDT	69.8	4.6	clear
08/03/2021 22:25 CDT	71.6	4.6	clear
08/03/2021 22:30 CDT	71.6	3.45	clear
08/03/2021 22:35 CDT	69.8	4.6	clear
08/03/2021 22:40 CDT	71.6	5.75	clear
08/03/2021 22:45 CDT	69.8	4.6	clear
08/03/2021 22:50 CDT	69.8	4.6	clear
08/03/2021 22:55 CDT	69.8	5.75	clear
08/03/2021 22:56 CDT	69.98	4.6	clear
08/03/2021 23:00 CDT	69.8	4.6	clear
08/03/2021 23:05 CDT	69.8	4.6	clear
08/03/2021 23:10 CDT	69.8	4.6	clear
08/03/2021 23:15 CDT	69.8	0	clear
08/03/2021 23:20 CDT	69.8	0	clear
08/03/2021 23:25 CDT	69.8	0	clear
08/03/2021 23:30 CDT	69.8	0	clear
08/03/2021 23:35 CDT	69.8	0	clear
08/03/2021 23:40 CDT	69.8	0	clear
08/03/2021 23:45 CDT	68	0	clear
08/03/2021 23:50 CDT	69.8	0	clear
08/03/2021 23:55 CDT	69.8	4.6	clear
08/03/2021 23:56 CDT	69.08	4.6	clear
08/04/2021 00:00 CDT	69.8	4.6	clear
08/04/2021 00:05 CDT	68	3.45	clear
08/04/2021 00:10 CDT	68	3.45	clear
08/04/2021 00:15 CDT	68	0	clear
08/04/2021 00:20 CDT	68	0	clear
08/04/2021 00:25 CDT	66.2	0	clear
08/04/2021 00:30 CDT	66.2	3.45	clear
08/04/2021 00:35 CDT	66.2	3.45	clear
08/04/2021 00:40 CDT	66.2	5.75	clear
08/04/2021 00:45 CDT	68	5.75	clear
08/04/2021 00:50 CDT	68	5.75	clear
08/04/2021 00:55 CDT	66.2	4.6	clear
08/04/2021 00:56 CDT	66.92	4.6	clear
08/04/2021 01:00 CDT	66.2	3.45	clear
08/04/2021 01:05 CDT	66.2	3.45	clear
08/04/2021 01:10 CDT	66.2	0	clear
08/04/2021 01:15 CDT	66.2	3.45	clear
08/04/2021 01:20 CDT	66.2	4.6	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/04/2021 01:25 CDT	66.2	3.45	clear
08/04/2021 01:30 CDT	66.2	3.45	clear
08/04/2021 01:35 CDT	66.2	4.6	clear
08/04/2021 01:40 CDT	66.2	4.6	clear
08/04/2021 01:45 CDT	66.2	3.45	clear
08/04/2021 01:50 CDT	66.2	3.45	clear
08/04/2021 01:55 CDT	66.2	3.45	clear
08/04/2021 01:56 CDT	66.02	3.45	clear
08/04/2021 02:00 CDT	66.2	3.45	clear
08/04/2021 02:05 CDT	66.2	0	clear
08/04/2021 02:10 CDT	66.2	0	clear
08/04/2021 02:15 CDT	66.2	0	clear
08/04/2021 02:20 CDT	66.2	0	clear
08/04/2021 02:25 CDT	66.2	3.45	clear
08/04/2021 02:30 CDT	64.4	4.6	clear
08/04/2021 02:35 CDT	64.4	3.45	clear
08/04/2021 02:40 CDT	64.4	3.45	clear
08/04/2021 02:45 CDT	64.4	4.6	clear
08/04/2021 02:50 CDT	64.4	4.6	clear
08/04/2021 02:55 CDT	64.4	4.6	clear
08/04/2021 02:56 CDT	64.94	4.6	clear
08/04/2021 03:00 CDT	64.4	4.6	clear
08/04/2021 03:05 CDT	64.4	4.6	clear
08/04/2021 03:10 CDT	64.4	4.6	clear
08/04/2021 03:15 CDT	64.4	4.6	clear
08/04/2021 03:20 CDT	64.4	4.6	clear
08/04/2021 03:25 CDT	64.4	4.6	clear
08/04/2021 03:30 CDT	64.4	3.45	clear
08/04/2021 03:35 CDT	64.4	3.45	clear
08/04/2021 03:40 CDT	64.4	3.45	clear
08/04/2021 03:45 CDT	64.4	3.45	clear
08/04/2021 03:50 CDT	64.4	3.45	clear
08/04/2021 03:55 CDT	64.4	3.45	clear
08/04/2021 03:56 CDT	64.94	3.45	clear
08/04/2021 04:00 CDT	64.4	0	clear
08/04/2021 04:05 CDT	64.4	0	clear
08/04/2021 04:10 CDT	64.4	3.45	clear
08/04/2021 04:15 CDT	66.2	0	clear
08/04/2021 04:20 CDT	66.2	3.45	clear
08/04/2021 04:25 CDT	64.4	4.6	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/04/2021 04:30 CDT	64.4	3.45	clear
08/04/2021 04:35 CDT	64.4	0	clear
08/04/2021 04:40 CDT	64.4	0	clear
08/04/2021 04:45 CDT	64.4	0	clear
08/04/2021 04:50 CDT	64.4	0	clear
08/04/2021 04:55 CDT	64.4	0	clear
08/04/2021 04:56 CDT	64.04	0	clear
08/04/2021 05:00 CDT	64.4	0	clear
08/04/2021 05:05 CDT	64.4	0	clear
08/04/2021 05:10 CDT	64.4	3.45	clear
08/04/2021 05:15 CDT	64.4	4.6	clear
08/04/2021 05:20 CDT	64.4	4.6	clear
08/04/2021 05:25 CDT	64.4	4.6	clear
08/04/2021 05:30 CDT	64.4	4.6	clear
08/04/2021 05:35 CDT	64.4	4.6	clear
08/04/2021 05:40 CDT	62.6	3.45	clear
08/04/2021 05:45 CDT	62.6	3.45	clear
08/04/2021 05:50 CDT	62.6	3.45	clear
08/04/2021 05:55 CDT	62.6	3.45	clear
08/04/2021 05:56 CDT	62.96	3.45	clear
08/04/2021 06:00 CDT	62.6	3.45	clear
08/04/2021 06:05 CDT	62.6	0	clear
08/04/2021 06:10 CDT	62.6	3.45	clear
08/04/2021 06:15 CDT	62.6	3.45	clear
08/04/2021 06:20 CDT	62.6	3.45	clear
08/04/2021 06:25 CDT	62.6	3.45	clear
08/04/2021 06:30 CDT	62.6	3.45	clear
08/04/2021 06:35 CDT	62.6	3.45	clear
08/04/2021 06:40 CDT	62.6	3.45	clear
08/04/2021 19:25 CDT	78.8	3.45	thin scattered
08/04/2021 19:30 CDT	78.8	4.6	thin scattered
08/04/2021 19:35 CDT	78.8	4.6	clear
08/04/2021 19:40 CDT	78.8	3.45	clear
08/04/2021 19:45 CDT	77	3.45	clear
08/04/2021 19:50 CDT	78.8	3.45	thin scattered
08/04/2021 19:55 CDT	77	5.75	scattered
08/04/2021 19:56 CDT	77	4.6	broken
08/04/2021 20:00 CDT	77	4.6	broken
08/04/2021 20:05 CDT	77	4.6	broken
08/04/2021 20:10 CDT	75.2	4.6	scattered

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/04/2021 20:15 CDT	75.2	4.6	broken
08/04/2021 20:20 CDT	75.2	4.6	broken
08/04/2021 20:25 CDT	75.2	3.45	broken
08/04/2021 20:30 CDT	75.2	3.45	broken
08/04/2021 20:35 CDT	75.2	4.6	broken
08/04/2021 20:40 CDT	75.2	4.6	broken
08/04/2021 20:45 CDT	75.2	4.6	scattered
08/04/2021 20:50 CDT	75.2	4.6	scattered
08/04/2021 20:55 CDT	73.4	4.6	thin scattered
08/04/2021 20:56 CDT	73.94	4.6	thin scattered
08/04/2021 21:00 CDT	73.4	4.6	thin scattered
08/04/2021 21:05 CDT	73.4	4.6	clear
08/04/2021 21:10 CDT	73.4	4.6	clear
08/04/2021 21:15 CDT	73.4	5.75	clear
08/04/2021 21:20 CDT	73.4	6.91	clear
08/04/2021 21:25 CDT	71.6	6.91	clear
08/04/2021 21:30 CDT	71.6	6.91	clear
08/04/2021 21:35 CDT	71.6	5.75	clear
08/04/2021 21:40 CDT	71.6	6.91	clear
08/04/2021 21:45 CDT	71.6	5.75	clear
08/04/2021 21:50 CDT	71.6	5.75	clear
08/04/2021 21:55 CDT	71.6	5.75	clear
08/04/2021 21:56 CDT	71.96	5.75	clear
08/04/2021 22:00 CDT	71.6	5.75	clear
08/04/2021 22:05 CDT	71.6	5.75	clear
08/04/2021 22:10 CDT	71.6	4.6	clear
08/04/2021 22:15 CDT	71.6	4.6	clear
08/04/2021 22:20 CDT	71.6	4.6	clear
08/04/2021 22:25 CDT	71.6	5.75	clear
08/04/2021 22:30 CDT	71.6	4.6	clear
08/04/2021 22:35 CDT	71.6	3.45	clear
08/04/2021 22:40 CDT	71.6	3.45	clear
08/04/2021 22:45 CDT	71.6	3.45	clear
08/04/2021 22:50 CDT	71.6	3.45	clear
08/04/2021 22:55 CDT	71.6	3.45	clear
08/04/2021 22:56 CDT	71.06	3.45	clear
08/04/2021 23:00 CDT	69.8	3.45	clear
08/04/2021 23:05 CDT	71.6	3.45	clear
08/04/2021 23:10 CDT	69.8	3.45	clear
08/04/2021 23:15 CDT	69.8	3.45	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/04/2021 23:20 CDT	69.8	3.45	clear
08/04/2021 23:25 CDT	69.8	4.6	clear
08/04/2021 23:30 CDT	69.8	3.45	clear
08/04/2021 23:35 CDT	69.8	3.45	clear
08/04/2021 23:40 CDT	69.8	3.45	clear
08/04/2021 23:45 CDT	69.8	4.6	clear
08/04/2021 23:50 CDT	68	4.6	clear
08/04/2021 23:55 CDT	68	4.6	clear
08/04/2021 23:56 CDT	69.08	3.45	clear
08/05/2021 00:00 CDT	69.8	3.45	clear
08/05/2021 00:05 CDT	69.8	4.6	clear
08/05/2021 00:10 CDT	69.8	4.6	clear
08/05/2021 00:15 CDT	69.8	4.6	clear
08/05/2021 00:20 CDT	69.8	4.6	clear
08/05/2021 00:25 CDT	68	4.6	clear
08/05/2021 00:30 CDT	68	3.45	clear
08/05/2021 00:35 CDT	68	4.6	clear
08/05/2021 00:40 CDT	68	4.6	clear
08/05/2021 00:45 CDT	68	4.6	clear
08/05/2021 00:50 CDT	68	4.6	clear
08/05/2021 00:55 CDT	68	3.45	clear
08/05/2021 00:56 CDT	68	3.45	clear
08/05/2021 01:00 CDT	68	4.6	clear
08/05/2021 01:05 CDT	66.2	4.6	clear
08/05/2021 01:10 CDT	68	4.6	clear
08/05/2021 01:15 CDT	66.2	4.6	clear
08/05/2021 01:20 CDT	66.2	4.6	clear
08/05/2021 01:25 CDT	66.2	4.6	clear
08/05/2021 01:30 CDT	66.2	4.6	clear
08/05/2021 01:35 CDT	66.2	0	clear
08/05/2021 01:40 CDT	66.2	0	clear
08/05/2021 01:45 CDT	66.2	3.45	clear
08/05/2021 01:50 CDT	68	3.45	clear
08/05/2021 01:55 CDT	66.2	3.45	clear
08/05/2021 01:56 CDT	66.92	3.45	clear
08/05/2021 02:00 CDT	66.2	3.45	clear
08/05/2021 02:05 CDT	66.2	3.45	clear
08/05/2021 02:10 CDT	66.2	3.45	clear
08/05/2021 02:15 CDT	66.2	3.45	clear
08/05/2021 02:20 CDT	66.2	3.45	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/05/2021 02:25 CDT	66.2	4.6	clear
08/05/2021 02:30 CDT	66.2	3.45	clear
08/05/2021 02:35 CDT	66.2	3.45	clear
08/05/2021 02:40 CDT	66.2	3.45	clear
08/05/2021 02:45 CDT	66.2	4.6	clear
08/05/2021 02:50 CDT	66.2	4.6	clear
08/05/2021 02:55 CDT	66.2	4.6	clear
08/05/2021 02:56 CDT	66.02	4.6	clear
08/05/2021 03:00 CDT	66.2	3.45	clear
08/05/2021 03:05 CDT	66.2	3.45	clear
08/05/2021 03:10 CDT	66.2	4.6	clear
08/05/2021 03:15 CDT	66.2	3.45	clear
08/05/2021 03:20 CDT	64.4	0	clear
08/05/2021 03:25 CDT	66.2	3.45	clear
08/05/2021 03:30 CDT	66.2	3.45	clear
08/05/2021 03:35 CDT	64.4	3.45	clear
08/05/2021 03:40 CDT	64.4	3.45	clear
08/05/2021 03:45 CDT	66.2	0	clear
08/05/2021 03:50 CDT	66.2	0	clear
08/05/2021 03:55 CDT	64.4	0	clear
08/05/2021 03:56 CDT	64.94	0	clear
08/05/2021 04:00 CDT	64.4	0	clear
08/05/2021 04:05 CDT	66.2	0	clear
08/05/2021 04:10 CDT	66.2	0	clear
08/05/2021 04:15 CDT	66.2	3.45	clear
08/05/2021 04:20 CDT	64.4	0	clear
08/05/2021 04:25 CDT	64.4	0	clear
08/05/2021 04:30 CDT	66.2	0	clear
08/05/2021 04:35 CDT	64.4	0	clear
08/05/2021 04:40 CDT	64.4	0	clear
08/05/2021 04:45 CDT	64.4	3.45	clear
08/05/2021 04:50 CDT	64.4	3.45	clear
08/05/2021 04:55 CDT	64.4	0	clear
08/05/2021 04:56 CDT	64.94	0	clear
08/05/2021 05:00 CDT	64.4	0	clear
08/05/2021 05:05 CDT	64.4	3.45	clear
08/05/2021 05:10 CDT	64.4	0	clear
08/05/2021 05:15 CDT	64.4	0	clear
08/05/2021 05:20 CDT	64.4	0	clear
08/05/2021 05:25 CDT	64.4	3.45	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/05/2021 05:30 CDT	64.4	0	clear
08/05/2021 05:40 CDT	64.4	4.6	clear
08/05/2021 05:45 CDT	64.4	3.45	clear
08/05/2021 05:50 CDT	64.4	4.6	clear
08/05/2021 05:55 CDT	64.4	4.6	clear
08/05/2021 05:56 CDT	64.04	4.6	clear
08/05/2021 06:05 CDT	64.4	0	clear
08/05/2021 06:10 CDT	64.4	0	clear
08/05/2021 06:15 CDT	64.4	0	clear
08/05/2021 06:20 CDT	64.4	3.45	clear
08/05/2021 06:25 CDT	64.4	3.45	clear
08/05/2021 06:30 CDT	64.4	3.45	clear
08/05/2021 06:35 CDT	64.4	3.45	clear
08/05/2021 06:40 CDT	64.4	4.6	clear
08/05/2021 19:25 CDT	82.4	3.45	broken
08/05/2021 19:35 CDT	80.6	3.45	scattered
08/05/2021 19:40 CDT	80.6	3.45	scattered
08/05/2021 19:45 CDT	80.6	3.45	thin scattered
08/05/2021 19:50 CDT	80.6	3.45	scattered
08/05/2021 19:55 CDT	80.6	3.45	broken
08/05/2021 19:56 CDT	80.06	3.45	broken
08/05/2021 20:00 CDT	80.6	3.45	broken
08/05/2021 20:05 CDT	80.6	0	broken
08/05/2021 20:10 CDT	78.8	0	overcast
08/05/2021 20:15 CDT	78.8	3.45	overcast
08/05/2021 20:20 CDT	78.8	3.45	overcast
08/05/2021 20:25 CDT	78.8	3.45	overcast
08/05/2021 20:30 CDT	78.8	3.45	overcast
08/05/2021 20:35 CDT	78.8	0	overcast
08/05/2021 20:40 CDT	80.6	3.45	overcast
08/05/2021 20:45 CDT	80.6	5.75	overcast
08/05/2021 20:50 CDT	80.6	4.6	overcast
08/05/2021 20:55 CDT	80.6	4.6	overcast
08/05/2021 20:56 CDT	80.96	4.6	overcast
08/05/2021 21:00 CDT	80.6	5.75	overcast
08/05/2021 21:05 CDT	80.6	6.91	overcast
08/05/2021 21:10 CDT	80.6	5.75	overcast
08/05/2021 21:15 CDT	78.8	4.6	overcast
08/05/2021 21:20 CDT	78.8	3.45	overcast
08/05/2021 21:25 CDT	78.8	3.45	overcast

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/05/2021 21:30 CDT	78.8	3.45	overcast
08/05/2021 21:35 CDT	77	4.6	overcast
08/05/2021 21:40 CDT	78.8	3.45	overcast
08/05/2021 21:45 CDT	78.8	3.45	overcast
08/05/2021 21:50 CDT	78.8	0	overcast
08/05/2021 21:55 CDT	78.8	0	overcast
08/05/2021 21:56 CDT	78.08	0	overcast
08/05/2021 22:00 CDT	78.8	0	overcast
08/05/2021 22:05 CDT	78.8	0	overcast
08/05/2021 22:10 CDT	78.8	0	overcast
08/05/2021 22:15 CDT	78.8	0	overcast
08/05/2021 22:20 CDT	78.8	0	broken
08/05/2021 22:25 CDT	77	0	broken
08/05/2021 22:30 CDT	77	0	broken
08/05/2021 22:35 CDT	77	0	broken
08/05/2021 22:40 CDT	78.8	0	broken
08/05/2021 22:45 CDT	78.8	0	broken
08/05/2021 22:50 CDT	77	0	broken
08/05/2021 22:55 CDT	77	0	broken
08/05/2021 22:56 CDT	77	0	broken
08/05/2021 23:00 CDT	75.2	0	overcast
08/05/2021 23:05 CDT	75.2	0	overcast
08/05/2021 23:10 CDT	75.2	3.45	overcast
08/05/2021 23:15 CDT	75.2	0	overcast
08/05/2021 23:20 CDT	75.2	0	overcast
08/05/2021 23:25 CDT	77	0	overcast
08/05/2021 23:30 CDT	77	0	overcast
08/05/2021 23:35 CDT	77	0	overcast
08/05/2021 23:40 CDT	77	0	overcast
08/05/2021 23:45 CDT	77	0	overcast
08/05/2021 23:50 CDT	77	3.45	overcast
08/05/2021 23:55 CDT	77	3.45	overcast
08/05/2021 23:56 CDT	77	3.45	overcast
08/06/2021 00:00 CDT	77	3.45	overcast
08/06/2021 00:05 CDT	75.2	0	overcast
08/06/2021 00:10 CDT	77	0	overcast
08/06/2021 00:15 CDT	78.8	0	overcast
08/06/2021 00:20 CDT	78.8	0	overcast
08/06/2021 00:25 CDT	78.8	3.45	overcast
08/06/2021 00:30 CDT	77	5.75	overcast

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/06/2021 00:35 CDT	75.2	8.06	overcast
08/06/2021 00:40 CDT	75.2	6.91	overcast
08/06/2021 00:45 CDT	75.2	4.6	overcast
08/06/2021 00:50 CDT	75.2	4.6	overcast
08/06/2021 00:55 CDT	75.2	0	overcast
08/06/2021 00:56 CDT	75.02	0	overcast
08/06/2021 01:00 CDT	75.2	3.45	overcast
08/06/2021 01:05 CDT	75.2	0	overcast
08/06/2021 01:10 CDT	75.2	0	overcast
08/06/2021 01:15 CDT	75.2	3.45	overcast
08/06/2021 01:20 CDT	75.2	3.45	overcast
08/06/2021 01:25 CDT	75.2	0	overcast
08/06/2021 01:30 CDT	75.2	0	overcast
08/06/2021 01:35 CDT	75.2	0	overcast
08/06/2021 01:40 CDT	75.2	0	overcast
08/06/2021 01:45 CDT	75.2	0	overcast
08/06/2021 01:50 CDT	75.2	0	overcast
08/06/2021 01:55 CDT	75.2	0	overcast
08/06/2021 01:56 CDT	75.92	0	overcast
08/06/2021 02:00 CDT	75.2	0	overcast
08/06/2021 02:05 CDT	75.2	0	overcast
08/06/2021 02:10 CDT	75.2	0	overcast
08/06/2021 02:15 CDT	75.2	0	broken
08/06/2021 02:20 CDT	75.2	0	broken
08/06/2021 02:25 CDT	75.2	3.45	broken
08/06/2021 02:30 CDT	75.2	3.45	broken
08/06/2021 02:35 CDT	75.2	6.91	thin scattered
08/06/2021 02:40 CDT	75.2	5.75	thin scattered
08/06/2021 02:45 CDT	75.2	5.75	thin scattered
08/06/2021 02:50 CDT	75.2	4.6	thin scattered
08/06/2021 02:55 CDT	75.2	4.6	clear
08/06/2021 02:56 CDT	75.92	4.6	clear
08/06/2021 03:00 CDT	75.2	4.6	clear
08/06/2021 03:05 CDT	75.2	0	clear
08/06/2021 03:10 CDT	77	0	thin scattered
08/06/2021 03:15 CDT	77	3.45	thin scattered
08/06/2021 03:20 CDT	77	0	thin scattered
08/06/2021 03:25 CDT	77	3.45	thin scattered
08/06/2021 03:30 CDT	77	0	thin scattered
08/06/2021 03:35 CDT	75.2	0	thin scattered

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/06/2021 03:40 CDT	75.2	0	thin scattered
08/06/2021 03:45 CDT	75.2	0	thin scattered
08/06/2021 03:50 CDT	75.2	0	thin scattered
08/06/2021 03:55 CDT	75.2	3.45	thin scattered
08/06/2021 03:56 CDT	75.02	3.45	thin scattered
08/06/2021 04:00 CDT	75.2	3.45	thin scattered
08/06/2021 04:05 CDT	75.2	3.45	thin scattered
08/06/2021 04:10 CDT	75.2	5.75	thin scattered
08/06/2021 04:15 CDT	75.2	4.6	clear
08/06/2021 04:20 CDT	75.2	3.45	clear
08/06/2021 04:25 CDT	75.2	3.45	clear
08/06/2021 04:30 CDT	75.2	3.45	clear
08/06/2021 04:35 CDT	75.2	3.45	clear
08/06/2021 04:40 CDT	75.2	3.45	clear
08/06/2021 04:45 CDT	75.2	0	clear
08/06/2021 04:50 CDT	75.2	3.45	clear
08/06/2021 04:55 CDT	75.2	3.45	clear
08/06/2021 04:56 CDT	75.02	3.45	clear
08/06/2021 05:00 CDT	75.2	3.45	clear
08/06/2021 05:05 CDT	75.2	3.45	thin scattered
08/06/2021 05:10 CDT	73.4	3.45	thin scattered
08/06/2021 05:15 CDT	73.4	0	thin scattered
08/06/2021 05:20 CDT	75.2	3.45	scattered
08/06/2021 05:25 CDT	75.2	3.45	broken
08/06/2021 05:30 CDT	73.4	0	broken
08/06/2021 05:35 CDT	75.2	0	broken
08/06/2021 05:40 CDT	75.2	3.45	overcast
08/06/2021 05:45 CDT	75.2	4.6	overcast
08/06/2021 05:50 CDT	75.2	3.45	overcast
08/06/2021 05:55 CDT	75.2	5.75	overcast
08/06/2021 05:56 CDT	75.02	5.75	overcast
08/06/2021 06:00 CDT	75.2	6.91	overcast
08/06/2021 06:05 CDT	75.2	6.91	overcast
08/06/2021 06:10 CDT	75.2	5.75	overcast
08/06/2021 06:15 CDT	75.2	6.91	overcast
08/06/2021 06:20 CDT	75.2	6.91	overcast
08/06/2021 06:25 CDT	75.2	6.91	overcast
08/06/2021 06:30 CDT	75.2	8.06	overcast
08/06/2021 06:35 CDT	75.2	6.91	overcast
08/06/2021 06:40 CDT	75.2	6.91	overcast

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/06/2021 19:25 CDT	80.6	4.6	scattered
08/06/2021 19:30 CDT	80.6	4.6	thin scattered
08/06/2021 19:35 CDT	80.6	5.75	thin scattered
08/06/2021 19:40 CDT	80.6	5.75	scattered
08/06/2021 19:45 CDT	80.6	4.6	broken
08/06/2021 19:50 CDT	80.6	4.6	scattered
08/06/2021 19:55 CDT	80.6	0	scattered
08/06/2021 19:56 CDT	80.06	0	scattered
08/06/2021 20:00 CDT	78.8	0	scattered
08/06/2021 20:05 CDT	77	0	broken
08/06/2021 20:10 CDT	78.8	0	broken
08/06/2021 20:15 CDT	78.8	0	broken
08/06/2021 20:20 CDT	75.2	0	scattered
08/06/2021 20:25 CDT	77	0	scattered
08/06/2021 20:30 CDT	77	0	scattered
08/06/2021 20:35 CDT	77	0	scattered
08/06/2021 20:40 CDT	78.8	4.6	scattered
08/06/2021 20:45 CDT	78.8	4.6	thin scattered
08/06/2021 20:50 CDT	78.8	3.45	thin scattered
08/06/2021 20:55 CDT	78.8	0	thin scattered
08/06/2021 20:56 CDT	78.98	0	thin scattered
08/06/2021 21:00 CDT	78.8	0	thin scattered
08/06/2021 21:05 CDT	75.2	4.6	clear
08/06/2021 21:10 CDT	78.8	4.6	clear
08/06/2021 21:15 CDT	78.8	3.45	clear
08/06/2021 21:20 CDT	78.8	5.75	clear
08/06/2021 21:25 CDT	77	5.75	clear
08/06/2021 21:30 CDT	77	4.6	clear
08/06/2021 21:35 CDT	78.8	4.6	clear
08/06/2021 21:40 CDT	78.8	4.6	clear
08/06/2021 21:45 CDT	78.8	4.6	clear
08/06/2021 21:50 CDT	78.8	4.6	clear
08/06/2021 21:55 CDT	78.8	5.75	clear
08/06/2021 21:56 CDT	78.08	4.6	clear
08/06/2021 22:00 CDT	78.8	6.91	clear
08/06/2021 22:05 CDT	78.8	4.6	clear
08/06/2021 22:10 CDT	77	3.45	clear
08/06/2021 22:20 CDT	73.4	4.6	clear
08/06/2021 22:25 CDT	73.4	4.6	clear
08/06/2021 22:30 CDT	73.4	4.6	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/06/2021 22:35 CDT	73.4	3.45	clear
08/06/2021 22:40 CDT	73.4	0	clear
08/06/2021 22:45 CDT	75.2	0	clear
08/07/2021 05:50 CDT		0	
08/07/2021 05:51 CDT	69.8	0	
08/07/2021 05:55 CDT	69.8	0	
08/07/2021 05:56 CDT	69.98	0	mist
08/07/2021 06:00 CDT	69.8	0	mist
08/07/2021 06:03 CDT	69.8	0	mist
08/07/2021 06:05 CDT	69.8	0	mist
08/07/2021 06:10 CDT	69.8	0	mist
08/07/2021 06:15 CDT	69.8	0	mist
08/07/2021 06:20 CDT	69.8	0	mist
08/07/2021 06:25 CDT	69.8	0	mist
08/07/2021 06:30 CDT	69.8	0	mist
08/07/2021 06:31 CDT	69.8	0	mist
08/07/2021 06:35 CDT	69.8	0	mist
08/07/2021 06:40 CDT	71.6	3.45	mist
08/07/2021 19:20 CDT	84.2	0	clear
08/07/2021 19:25 CDT	84.2	0	clear
08/07/2021 19:30 CDT	84.2	0	clear
08/07/2021 19:35 CDT	82.4	0	clear
08/07/2021 19:40 CDT	82.4	0	clear
08/07/2021 19:45 CDT	82.4	0	clear
08/07/2021 19:50 CDT	82.4	0	clear
08/07/2021 19:55 CDT	80.6	0	clear
08/07/2021 19:56 CDT	80.96	0	clear
08/07/2021 20:00 CDT	80.6	0	clear
08/07/2021 20:05 CDT	80.6	0	clear
08/07/2021 20:10 CDT	80.6	0	clear
08/07/2021 20:15 CDT	80.6	0	clear
08/07/2021 20:20 CDT	80.6	0	clear
08/07/2021 20:25 CDT	80.6	0	clear
08/07/2021 20:30 CDT	80.6	0	clear
08/07/2021 20:35 CDT	80.6	0	clear
08/07/2021 20:40 CDT	78.8	0	clear
08/07/2021 20:45 CDT	78.8	0	clear
08/07/2021 20:50 CDT	78.8	0	clear
08/07/2021 20:55 CDT	77	0	clear
08/07/2021 20:56 CDT	77	0	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/07/2021 21:00 CDT	77	0	clear
08/07/2021 21:05 CDT	78.8	0	clear
08/07/2021 21:10 CDT	78.8	0	clear
08/07/2021 21:15 CDT	78.8	0	clear
08/07/2021 21:25 CDT	77	0	clear
08/07/2021 21:30 CDT	77	0	clear
08/07/2021 21:35 CDT	77	0	clear
08/07/2021 21:40 CDT	77	0	clear
08/07/2021 21:45 CDT	77	0	clear
08/07/2021 21:50 CDT	75.2	0	clear
08/07/2021 21:55 CDT	75.2	0	clear
08/07/2021 21:56 CDT	75.92	0	clear
08/07/2021 22:00 CDT	75.2	0	clear
08/07/2021 22:05 CDT	75.2	0	clear
08/07/2021 22:10 CDT	75.2	3.45	clear
08/07/2021 22:15 CDT	75.2	3.45	clear
08/07/2021 22:20 CDT	73.4	3.45	clear
08/07/2021 22:25 CDT	73.4	3.45	clear
08/07/2021 22:30 CDT	73.4	3.45	clear
08/07/2021 22:35 CDT	73.4	3.45	clear
08/07/2021 22:40 CDT	73.4	3.45	clear
08/07/2021 22:45 CDT	73.4	3.45	clear
08/07/2021 22:50 CDT	73.4	0	clear
08/07/2021 22:55 CDT	73.4	0	clear
08/07/2021 22:56 CDT	73.94	0	clear
08/07/2021 23:00 CDT	73.4	3.45	clear
08/07/2021 23:05 CDT	73.4	0	clear
08/07/2021 23:10 CDT	73.4	3.45	clear
08/07/2021 23:15 CDT	73.4	0	clear
08/07/2021 23:20 CDT	73.4	0	clear
08/07/2021 23:25 CDT	73.4	0	clear
08/07/2021 23:30 CDT	73.4	0	clear
08/07/2021 23:35 CDT	73.4	0	clear
08/07/2021 23:40 CDT	73.4	0	clear
08/07/2021 23:50 CDT	73.4	3.45	clear
08/07/2021 23:55 CDT	73.4	3.45	clear
08/07/2021 23:56 CDT	73.04	3.45	clear
08/08/2021 00:00 CDT	73.4	0	clear
08/08/2021 00:05 CDT	73.4	0	clear
08/08/2021 00:10 CDT	73.4	0	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/08/2021 00:15 CDT	71.6	0	clear
08/08/2021 00:20 CDT	71.6	0	clear
08/08/2021 00:25 CDT	73.4	0	clear
08/08/2021 00:30 CDT	71.6	0	clear
08/08/2021 00:35 CDT	73.4	0	clear
08/08/2021 00:40 CDT	73.4	0	clear
08/08/2021 00:45 CDT	73.4	0	clear
08/08/2021 00:50 CDT	73.4	0	clear
08/08/2021 00:55 CDT	73.4	0	clear
08/08/2021 00:56 CDT	73.04	0	clear
08/08/2021 01:00 CDT	73.4	0	clear
08/08/2021 01:05 CDT	73.4	0	clear
08/08/2021 01:10 CDT	73.4	0	clear
08/08/2021 01:15 CDT	73.4	0	clear
08/08/2021 01:20 CDT	71.6	0	clear
08/08/2021 01:25 CDT	71.6	0	clear
08/08/2021 01:30 CDT	71.6	0	clear
08/08/2021 01:35 CDT	71.6	0	clear
08/08/2021 01:40 CDT	71.6	0	clear
08/08/2021 01:45 CDT	71.6	0	clear
08/08/2021 01:50 CDT	71.6	0	clear
08/08/2021 01:55 CDT	71.6	0	clear
08/08/2021 01:56 CDT	71.06	0	clear
08/08/2021 02:00 CDT	71.6	0	clear
08/08/2021 02:05 CDT	71.6	0	clear
08/08/2021 02:10 CDT	71.6	0	clear
08/08/2021 02:15 CDT	71.6	0	clear
08/08/2021 02:20 CDT	71.6	0	clear
08/08/2021 02:25 CDT	71.6	0	clear
08/08/2021 02:30 CDT	71.6	0	clear
08/08/2021 02:35 CDT	71.6	0	clear
08/08/2021 02:40 CDT	71.6	0	clear
08/08/2021 02:45 CDT	71.6	0	clear
08/08/2021 02:50 CDT	71.6	0	clear
08/08/2021 02:55 CDT	71.6	0	clear
08/08/2021 02:56 CDT	71.96	0	clear
08/08/2021 03:00 CDT	71.6	0	clear
08/08/2021 03:05 CDT	71.6	0	clear
08/08/2021 03:10 CDT	71.6	0	mist
08/08/2021 03:15 CDT	69.8	0	mist

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/08/2021 03:20 CDT	69.8	0	clear
08/08/2021 03:25 CDT	69.8	0	clear
08/08/2021 03:30 CDT	69.8	0	clear
08/08/2021 03:35 CDT	69.8	0	clear
08/08/2021 03:40 CDT	71.6	0	clear
08/08/2021 03:45 CDT	71.6	0	clear
08/08/2021 03:50 CDT	71.6	3.45	clear
08/08/2021 03:55 CDT	71.6	0	clear
08/08/2021 03:56 CDT	71.06	0	clear
08/08/2021 04:00 CDT	69.8	0	clear
08/08/2021 04:05 CDT	69.8	0	clear
08/08/2021 04:10 CDT	71.6	0	clear
08/08/2021 04:15 CDT	71.6	0	clear
08/08/2021 04:20 CDT	69.8	0	clear
08/08/2021 04:25 CDT	69.8	0	clear
08/08/2021 04:30 CDT	69.8	0	clear
08/08/2021 04:35 CDT	69.8	0	clear
08/08/2021 04:40 CDT	69.8	0	clear
08/08/2021 04:45 CDT	71.6	0	clear
08/08/2021 04:50 CDT	71.6	0	clear
08/08/2021 04:55 CDT	71.6	3.45	clear
08/08/2021 04:56 CDT	71.06	3.45	clear
08/08/2021 05:00 CDT	71.6	3.45	clear
08/08/2021 05:05 CDT	69.8	3.45	clear
08/08/2021 05:10 CDT	69.8	3.45	clear
08/08/2021 05:15 CDT	69.8	3.45	clear
08/08/2021 05:20 CDT	69.8	3.45	clear
08/08/2021 05:25 CDT	71.6	4.6	clear
08/08/2021 05:30 CDT	71.6	0	clear
08/08/2021 05:35 CDT	71.6	0	clear
08/08/2021 05:40 CDT	71.6	0	clear
08/08/2021 05:45 CDT	71.6	0	clear
08/08/2021 05:50 CDT	71.6	0	clear
08/08/2021 05:55 CDT	71.6	0	clear
08/08/2021 05:56 CDT	71.06	0	clear
08/08/2021 06:00 CDT	69.8	0	mist
08/08/2021 06:03 CDT	69.8	0	mist
08/08/2021 06:05 CDT	69.8	0	mist
08/08/2021 06:10 CDT	69.8	0	mist
08/08/2021 06:15 CDT	69.8	0	mist

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/08/2021 06:20 CDT	69.8	0	mist
08/08/2021 06:25 CDT	69.8	0	mist
08/08/2021 06:30 CDT	69.8	0	mist
08/08/2021 06:35 CDT	71.6	0	mist
08/08/2021 06:37 CDT	71.6	0	mist
08/08/2021 06:40 CDT	71.6	0	mist
08/08/2021 19:20 CDT	84.2	5.75	clear
08/08/2021 19:25 CDT	84.2	5.75	clear
08/08/2021 19:35 CDT	82.4	5.75	clear
08/08/2021 19:40 CDT	82.4	5.75	clear
08/08/2021 19:45 CDT	82.4	5.75	clear
08/08/2021 19:50 CDT	82.4	6.91	clear
08/08/2021 19:55 CDT	82.4	6.91	clear
08/08/2021 19:56 CDT	82.94	6.91	clear
08/08/2021 20:00 CDT	82.4	6.91	clear
08/08/2021 20:05 CDT	82.4	5.75	clear
08/08/2021 20:10 CDT	82.4	6.91	clear
08/08/2021 20:15 CDT	82.4	5.75	clear
08/08/2021 20:20 CDT	82.4	5.75	thin scattered
08/08/2021 20:25 CDT	82.4	5.75	scattered
08/08/2021 20:30 CDT	82.4	5.75	broken
08/08/2021 20:35 CDT	82.4	5.75	broken
08/08/2021 20:40 CDT	82.4	5.75	broken
08/08/2021 20:45 CDT	82.4	5.75	scattered
08/08/2021 20:50 CDT	80.6	5.75	scattered
08/08/2021 20:55 CDT	80.6	5.75	thin scattered
08/08/2021 20:56 CDT	80.96	5.75	thin scattered
08/08/2021 21:00 CDT	80.6	6.91	thin scattered
08/08/2021 21:05 CDT	80.6	5.75	clear
08/08/2021 21:10 CDT	80.6	5.75	clear
08/08/2021 21:15 CDT	80.6	5.75	clear
08/08/2021 21:20 CDT	80.6	5.75	clear
08/08/2021 21:25 CDT	80.6	6.91	clear
08/08/2021 21:30 CDT	80.6	5.75	clear
08/08/2021 21:35 CDT	80.6	5.75	clear
08/08/2021 21:40 CDT	80.6	5.75	clear
08/08/2021 21:45 CDT	80.6	5.75	clear
08/08/2021 21:50 CDT	80.6	4.6	clear
08/08/2021 21:55 CDT	80.6	4.6	clear
08/08/2021 21:56 CDT	80.96	4.6	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/08/2021 22:00 CDT	80.6	4.6	clear
08/08/2021 22:05 CDT	80.6	4.6	clear
08/08/2021 22:10 CDT	80.6	5.75	clear
08/08/2021 22:15 CDT	80.6	5.75	clear
08/08/2021 22:20 CDT	80.6	5.75	clear
08/08/2021 22:30 CDT	80.6	5.75	clear
08/08/2021 22:35 CDT	80.6	5.75	clear
08/08/2021 22:40 CDT	78.8	6.91	clear
08/08/2021 22:45 CDT	78.8	6.91	clear
08/08/2021 22:50 CDT	78.8	6.91	clear
08/08/2021 22:55 CDT	78.8	5.75	clear
08/08/2021 22:56 CDT	78.98	5.75	clear
08/08/2021 23:00 CDT	78.8	5.75	clear
08/08/2021 23:05 CDT	78.8	5.75	clear
08/08/2021 23:10 CDT	78.8	5.75	clear
08/08/2021 23:15 CDT	78.8	5.75	clear
08/08/2021 23:20 CDT	78.8	5.75	clear
08/08/2021 23:25 CDT	78.8	6.91	clear
08/08/2021 23:30 CDT	78.8	5.75	clear
08/08/2021 23:35 CDT	78.8	5.75	clear
08/08/2021 23:40 CDT	78.8	4.6	clear
08/08/2021 23:45 CDT	77	4.6	clear
08/08/2021 23:50 CDT	77	5.75	clear
08/08/2021 23:55 CDT	77	5.75	clear
08/08/2021 23:56 CDT	77	5.75	clear
08/09/2021 00:00 CDT	77	5.75	clear
08/09/2021 00:05 CDT	78.8	5.75	clear
08/09/2021 00:10 CDT	78.8	6.91	clear
08/09/2021 00:15 CDT	78.8	6.91	clear
08/09/2021 00:20 CDT	77	5.75	clear
08/09/2021 00:25 CDT	75.2	6.91	clear
08/09/2021 00:30 CDT	75.2	5.75	clear
08/09/2021 00:35 CDT	75.2	5.75	clear
08/09/2021 00:40 CDT	75.2	5.75	clear
08/09/2021 00:45 CDT	75.2	5.75	clear
08/09/2021 00:50 CDT	75.2	6.91	clear
08/09/2021 00:55 CDT	75.2	8.06	clear
08/09/2021 00:56 CDT	75.92	8.06	clear
08/09/2021 01:00 CDT	75.2	6.91	clear
08/09/2021 01:05 CDT	75.2	5.75	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/09/2021 01:10 CDT	75.2	5.75	clear
08/09/2021 01:15 CDT	77	5.75	clear
08/09/2021 01:20 CDT	77	6.91	clear
08/09/2021 01:25 CDT	77	5.75	clear
08/09/2021 01:30 CDT	75.2	5.75	clear
08/09/2021 01:35 CDT	75.2	5.75	clear
08/09/2021 01:40 CDT	75.2	5.75	clear
08/09/2021 01:45 CDT	75.2	5.75	clear
08/09/2021 01:50 CDT	75.2	5.75	clear
08/09/2021 01:55 CDT	75.2	6.91	clear
08/09/2021 01:56 CDT	75.92	6.91	clear
08/09/2021 02:00 CDT	75.2	6.91	clear
08/09/2021 02:05 CDT	75.2	5.75	clear
08/09/2021 02:10 CDT	75.2	5.75	clear
08/09/2021 02:15 CDT	75.2	3.45	clear
08/09/2021 02:20 CDT	75.2	3.45	clear
08/09/2021 02:25 CDT	75.2	3.45	clear
08/09/2021 02:30 CDT	75.2	4.6	clear
08/09/2021 02:35 CDT	75.2	4.6	clear
08/09/2021 02:40 CDT	75.2	4.6	clear
08/09/2021 02:45 CDT	75.2	4.6	clear
08/09/2021 02:50 CDT	75.2	3.45	clear
08/09/2021 02:55 CDT	75.2	3.45	clear
08/09/2021 02:56 CDT	75.92	3.45	clear
08/09/2021 03:00 CDT	75.2	3.45	clear
08/09/2021 03:05 CDT	75.2	3.45	clear
08/09/2021 03:10 CDT	73.4	4.6	clear
08/09/2021 03:15 CDT	73.4	5.75	clear
08/09/2021 03:20 CDT	73.4	5.75	clear
08/09/2021 03:25 CDT	73.4	4.6	clear
08/09/2021 03:30 CDT	73.4	4.6	clear
08/09/2021 03:35 CDT	73.4	4.6	clear
08/09/2021 03:40 CDT	73.4	4.6	clear
08/09/2021 03:45 CDT	73.4	4.6	clear
08/09/2021 03:50 CDT	73.4	5.75	clear
08/09/2021 03:55 CDT	73.4	5.75	clear
08/09/2021 03:56 CDT	73.94	5.75	clear
08/09/2021 04:00 CDT	73.4	5.75	clear
08/09/2021 04:05 CDT	73.4	5.75	clear
08/09/2021 04:10 CDT	73.4	5.75	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/09/2021 04:15 CDT	75.2	4.6	clear
08/09/2021 04:20 CDT	73.4	4.6	clear
08/09/2021 04:25 CDT	73.4	5.75	clear
08/09/2021 04:30 CDT	73.4	5.75	clear
08/09/2021 04:35 CDT	73.4	5.75	clear
08/09/2021 04:40 CDT	73.4	5.75	clear
08/09/2021 04:45 CDT	73.4	4.6	clear
08/09/2021 04:50 CDT	73.4	4.6	clear
08/09/2021 04:55 CDT	73.4	4.6	clear
08/09/2021 04:56 CDT	73.94	4.6	clear
08/09/2021 05:00 CDT	73.4	3.45	clear
08/09/2021 05:05 CDT	73.4	3.45	clear
08/09/2021 05:10 CDT	73.4	0	clear
08/09/2021 05:15 CDT	73.4	0	clear
08/09/2021 05:20 CDT	75.2	0	clear
08/09/2021 05:25 CDT	73.4	0	clear
08/09/2021 05:30 CDT	73.4	0	clear
08/09/2021 05:35 CDT	73.4	0	clear
08/09/2021 05:45 CDT	75.2	0	clear
08/09/2021 05:50 CDT	73.4	0	clear
08/09/2021 05:55 CDT	73.4	0	clear
08/09/2021 05:56 CDT	73.94	0	clear
08/09/2021 06:00 CDT	73.4	0	clear
08/09/2021 06:10 CDT	75.2	0	clear
08/09/2021 06:15 CDT	73.4	0	clear
08/09/2021 06:20 CDT	73.4	0	clear
08/09/2021 06:25 CDT	75.2	0	clear
08/09/2021 06:30 CDT	75.2	0	clear
08/09/2021 06:35 CDT	75.2	0	clear
08/09/2021 06:40 CDT	75.2	0	clear
08/09/2021 19:20 CDT	86	4.6	clear
08/09/2021 19:25 CDT	86	5.75	clear
08/09/2021 19:30 CDT	86	5.75	clear
08/09/2021 19:35 CDT	86	4.6	clear
08/09/2021 19:40 CDT	86	5.75	clear
08/09/2021 19:45 CDT	84.2	5.75	clear
08/09/2021 19:50 CDT	84.2	5.75	clear
08/09/2021 19:55 CDT	84.2	5.75	clear
08/09/2021 19:56 CDT	84.92	4.6	clear
08/09/2021 20:00 CDT	84.2	5.75	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/09/2021 20:05 CDT	84.2	5.75	clear
08/09/2021 20:10 CDT	84.2	4.6	clear
08/09/2021 20:15 CDT	84.2	5.75	clear
08/09/2021 20:20 CDT	84.2	5.75	clear
08/09/2021 20:25 CDT	84.2	5.75	clear
08/09/2021 20:30 CDT	84.2	5.75	clear
08/09/2021 20:35 CDT	84.2	4.6	clear
08/09/2021 20:40 CDT	84.2	4.6	clear
08/09/2021 20:45 CDT	84.2	4.6	clear
08/09/2021 20:50 CDT	82.4	4.6	clear
08/09/2021 20:55 CDT	82.4	3.45	clear
08/09/2021 20:56 CDT	82.94	3.45	clear
08/09/2021 21:00 CDT	82.4	4.6	clear
08/09/2021 21:05 CDT	82.4	3.45	clear
08/09/2021 21:10 CDT	82.4	3.45	clear
08/09/2021 21:15 CDT	80.6	4.6	clear
08/09/2021 21:20 CDT	80.6	3.45	clear
08/09/2021 21:25 CDT	80.6	4.6	clear
08/09/2021 21:30 CDT	80.6	5.75	clear
08/09/2021 21:35 CDT	80.6	5.75	clear
08/09/2021 21:40 CDT	80.6	5.75	clear
08/09/2021 21:45 CDT	80.6	5.75	clear
08/09/2021 21:50 CDT	80.6	4.6	clear
08/09/2021 21:55 CDT	80.6	4.6	clear
08/09/2021 21:56 CDT	80.96	4.6	clear
08/09/2021 22:00 CDT	80.6	4.6	clear
08/09/2021 22:05 CDT	80.6	4.6	clear
08/09/2021 22:10 CDT	80.6	4.6	clear
08/09/2021 22:15 CDT	80.6	4.6	clear
08/09/2021 22:20 CDT	80.6	9.21	clear
08/09/2021 22:25 CDT	82.4	8.06	clear
08/09/2021 22:30 CDT	82.4	5.75	clear
08/09/2021 22:35 CDT	82.4	6.91	clear
08/09/2021 22:40 CDT	82.4	5.75	clear
08/09/2021 22:45 CDT	82.4	6.91	clear
08/09/2021 22:50 CDT	82.4	5.75	clear
08/09/2021 22:55 CDT	82.4	6.91	clear
08/09/2021 22:56 CDT	82.04	6.91	clear
08/09/2021 23:00 CDT	82.4	8.06	clear
08/09/2021 23:05 CDT	80.6	6.91	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/09/2021 23:10 CDT	80.6	6.91	clear
08/09/2021 23:15 CDT	80.6	5.75	clear
08/09/2021 23:20 CDT	80.6	8.06	clear
08/09/2021 23:25 CDT	80.6	6.91	clear
08/09/2021 23:30 CDT	80.6	9.21	clear
08/09/2021 23:35 CDT	80.6	8.06	clear
08/09/2021 23:40 CDT	80.6	6.91	clear
08/09/2021 23:45 CDT	80.6	6.91	clear
08/09/2021 23:50 CDT	80.6	8.06	clear
08/09/2021 23:55 CDT	80.6	8.06	clear
08/09/2021 23:56 CDT	80.06	8.06	clear
08/10/2021 00:00 CDT	80.6	8.06	clear
08/10/2021 00:05 CDT	80.6	9.21	clear
08/10/2021 00:10 CDT	80.6	9.21	clear
08/10/2021 00:15 CDT	80.6	8.06	clear
08/10/2021 00:20 CDT	80.6	8.06	clear
08/10/2021 00:25 CDT	80.6	6.91	clear
08/10/2021 00:30 CDT	78.8	6.91	clear
08/10/2021 00:35 CDT	78.8	5.75	clear
08/10/2021 00:40 CDT	78.8	8.06	clear
08/10/2021 00:45 CDT	78.8	6.91	clear
08/10/2021 00:50 CDT	78.8	5.75	clear
08/10/2021 00:55 CDT	78.8	5.75	clear
08/10/2021 00:56 CDT	78.98	5.75	clear
08/10/2021 01:00 CDT	78.8	6.91	clear
08/10/2021 01:05 CDT	78.8	5.75	clear
08/10/2021 01:10 CDT	78.8	4.6	clear
08/10/2021 01:15 CDT	77	4.6	clear
08/10/2021 01:20 CDT	78.8	5.75	clear
08/10/2021 01:25 CDT	78.8	6.91	clear
08/10/2021 01:30 CDT	78.8	8.06	clear
08/10/2021 01:35 CDT	78.8	5.75	clear
08/10/2021 01:40 CDT	78.8	6.91	clear
08/10/2021 01:45 CDT	78.8	5.75	clear
08/10/2021 01:50 CDT	77	6.91	clear
08/10/2021 01:55 CDT	77	8.06	clear
08/10/2021 01:56 CDT	77	6.91	clear
08/10/2021 02:00 CDT	77	5.75	clear
08/10/2021 02:05 CDT	77	4.6	clear
08/10/2021 02:10 CDT	77	4.6	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/10/2021 02:15 CDT	77	4.6	clear
08/10/2021 02:20 CDT	75.2	4.6	clear
08/10/2021 02:25 CDT	75.2	4.6	clear
08/10/2021 02:30 CDT	77	4.6	clear
08/10/2021 02:35 CDT	77	4.6	clear
08/10/2021 02:40 CDT	75.2	5.75	clear
08/10/2021 02:45 CDT	75.2	4.6	clear
08/10/2021 02:50 CDT	77	4.6	clear
08/10/2021 02:55 CDT	77	4.6	clear
08/10/2021 02:56 CDT	77	4.6	clear
08/10/2021 03:00 CDT	77	4.6	clear
08/10/2021 03:05 CDT	77	3.45	clear
08/10/2021 03:10 CDT	77	0	clear
08/10/2021 03:15 CDT	77	0	clear
08/10/2021 03:20 CDT	77	0	clear
08/10/2021 03:25 CDT	77	3.45	clear
08/10/2021 03:30 CDT	75.2	0	clear
08/10/2021 03:35 CDT	75.2	0	clear
08/10/2021 03:40 CDT	75.2	0	clear
08/10/2021 03:45 CDT	75.2	0	clear
08/10/2021 03:50 CDT	75.2	0	clear
08/10/2021 03:55 CDT	75.2	0	clear
08/10/2021 03:56 CDT	75.92	0	clear
08/10/2021 04:00 CDT	75.2	0	clear
08/10/2021 04:05 CDT	75.2	0	clear
08/10/2021 04:10 CDT	75.2	3.45	clear
08/10/2021 04:15 CDT	75.2	0	clear
08/10/2021 04:20 CDT	75.2	4.6	clear
08/10/2021 04:25 CDT	75.2	4.6	clear
08/10/2021 04:30 CDT	77	4.6	clear
08/10/2021 04:35 CDT	77	3.45	clear
08/10/2021 04:40 CDT	77	0	clear
08/10/2021 04:45 CDT	75.2	0	clear
08/10/2021 04:50 CDT	75.2	3.45	clear
08/10/2021 04:55 CDT	75.2	0	clear
08/10/2021 04:56 CDT	75.92	0	clear
08/10/2021 05:00 CDT	75.2	3.45	clear
08/10/2021 05:05 CDT	75.2	3.45	clear
08/10/2021 05:10 CDT	75.2	3.45	clear
08/10/2021 05:15 CDT	75.2	0	clear

Date & Time	Temperature (°F)	Wind Speed (mph)	Weather Summary
08/10/2021 05:20 CDT	75.2	0	clear
08/10/2021 05:25 CDT	75.2	3.45	clear
08/10/2021 05:30 CDT	73.4	5.75	clear
08/10/2021 05:35 CDT	75.2	6.91	clear
08/10/2021 05:45 CDT	75.2	5.75	clear
08/10/2021 05:50 CDT	75.2	6.91	clear
08/10/2021 05:55 CDT	75.2	5.75	clear
08/10/2021 05:56 CDT	75.92	5.75	clear
08/10/2021 06:00 CDT	75.2	4.6	clear
08/10/2021 06:05 CDT	75.2	3.45	clear
08/10/2021 06:10 CDT	75.2	3.45	clear
08/10/2021 06:15 CDT	75.2	5.75	clear
08/10/2021 06:20 CDT	75.2	4.6	clear
08/10/2021 06:25 CDT	75.2	4.6	clear
08/10/2021 06:30 CDT	75.2	4.6	clear
08/10/2021 06:35 CDT	75.2	3.45	clear
08/10/2021 06:40 CDT	75.2	3.45	clear

Source: Weather data for KGTR from www.mesowest.utah.edu

APPENDIX D -KEY ROLES AND QUALIFICATIONS

Golden Triangle II Acoustic Bat Survey		
Name/Education	Experience	Project Role
Josiah Maine B.S. Wildlife Biology M.S. Zoology	10 years conducting bat surveys, acoustic bat identification, and environmental permitting	Lead Bat Biologist; Survey Development, Acoustic Site Selection, Data Analytics, Primary Report Author
Grant Dickerson B.S Wildlife Biology M.S. Biology	5 years conducting bat surveys	Bat Biologist; Site Selection and Acoustic Monitor Deployment
Brooke Hines B.S. Wildlife Biology M.S. Biology, Applied Ecology	21 years in protected bat species consultation to include, habitat and biological assessments, writing state and federal guidance for bat surveys, and coordination with state and federal agencies on policy implementation	Bat Biologist; Senior Technical Lead/Review of Bat Survey Plan/Report
Jesse Brown B.A. Biology M.S. Biology	12 years in environmental permitting and protected species evaluations	Field Survey Coordination, Habitat Assessment, Acoustic Monitor Deployment, Deputy PM

Josiah J. Maine

Curriculum Vitae
9400 Ward Pkwy
Kansas City, MO 64114
jjmaine@burnsmcd.com
816-448-7519

EDUCATION

2014 **Southern Illinois University,** Carbondale, IL
M.S. Zoology, conferred December 2014
Thesis: Trophic Ecology of Insectivorous Bats in Agroecosystems

2011 **Kansas State University,** Manhattan, KS
B.S. Fisheries, Wildlife, and Conservation Biology, conferred December 2011

BAT NETTING, TRACKING, AND ACOUSTIC EXPERIENCE

Bat Biologist, ITC Cardinal-Hickory Creek Transmission Line Project, Clayton County, IA, August 2020
Lead bat biologist responsible for conducting bat surveys for a potential transmission line that crossed a national wildlife refuge. Surveys included acoustic surveys at two sites and mist-net surveys at two sites. Species captured included little brown bat, tricolored bat, and eastern red bat.
Approximate time: 4 detector-nights, 4 nights of netting

Bat Biologist, Duke UL06 Pipeline Replacement Project, Campbell County, KY, June 2020
Lead bat biologist responsible for conducting acoustic presence/absence surveys for a pipeline replacement project. One acoustic site was surveyed for two detector-nights. Automated identification software indicated that northern long-eared bats may occur on the site. Follow-up manual vetting conducted by Josiah Maine identified calls that had characteristics consistent with northern long-eared bats.
Approximate time: 2 detector-nights

Bat Biologist and Land Manager, Chariton Hills Conservation Bank, Northeast Missouri, Jan. 2017 - Present
Lead bat biologist and land manager for the Chariton Hills Conservation Bank. Played a key role in the development of the bat conservation bank, which was be the first conservation bank for Region 3 of the U.S. Fish & Wildlife Service. Identified suitable properties and led the acoustic, mist-netting, and tracking studies on the bank properties, focused on Indiana bat and northern long-eared bat. Made significant contributions to the management plan for the bank. As the land manager, coordinates permitting, biological studies, forest management, property security, and recreational activities for the bank.
Approximate time: 14 netting survey nights, 14 nights of acoustics, 2 Indiana bats and 1 northern long-eared bat captured

Bat Biologist, Alta Call Center Project, Fort Myers, FL, October 2019
Lead bat biologist responsible for conducting Florida bonneted bat presence/absence surveys for a development site using acoustic equipment. This study allowed the client to evaluate potential risk of the project to bats, in coordination with the U.S. Fish & Wildlife Service.
Approximate time: 18 detector-nights

Bat Biologist, Boone Area Improvements Transmission Line, Boone and Kanawha Counties, WV, 2018
Lead bat biologist responsible for conducting presence/absence surveys for a potential transmission line. Surveys included acoustic surveys at 53 sites, with follow-up netting at 3 sites. Species captured included eastern small-footed bat, hoary bat, eastern red bat, and big brown bat.
Approximate time: 106 detector-nights, 9 nights of netting

Bat Biologist, Kossuth Wind Farm, Iowa, 2018
Lead bat biologist responsible for conducting presence/absence surveys for a wind farm site using acoustic equipment. Target species included northern long-eared bat, little brown bat, and tricolored bat. This study allowed the client to evaluate potential risk of the project to bats, in coordination with the U.S. Fish & Wildlife Service.
Approximate time: 32 detector-nights

Bat Biologist, Bat Mitigation Property Assessment, Iowa, 2018
Lead bat biologist responsible for conducting presence/absence surveys for several potential bat mitigation properties using acoustic equipment. Target species included Indiana bat, northern long-eared bat, little brown bat, and tricolored bat. Acoustic bat identification was conducted with Kaleidoscope software followed by manual vetting. The purpose of the study was to determine species presence and suitability for multiple properties in Iowa that could serve as bat mitigation sites in the future.
Approximate time: 8 nights of acoustics, Indiana bats and northern long-eared bats identified

Bat Biologist, Deuel Wind Project, Deuel County, SD, 2017
Lead bat biologist responsible for conducting a season-long bat study using acoustic equipment. The purpose of the bat study was to identify overall levels and seasonal patterns of bat activity within and below the rotor-swept area of a proposed wind farm. This study allowed the client to evaluate potential risk of the project to bats, in coordination with the U.S. Fish & Wildlife Service.
Approximate time: 90 nights of acoustics

Bat Biologist, Whispering Willow Wind Project, Franklin County, IA, 2017
Lead bat biologist responsible for conducting bat study for a pre-construction wind project. The study included presence/absence surveys for the northern long-eared bat and a season-long bat study using acoustic equipment on meteorological towers. Northern long-eared bat acoustic data was processed through automated identification software, and manual vetting (qualitative identification by Josiah Maine) was conducted. Acoustic recordings were provided to USFWS to bolster data on the distribution of the northern long-eared bat in Iowa.
Approximate time: 200 nights of acoustics, northern long-eared bats identified

Bat Biologist, Dakota Access Pipeline Project, Iowa, 2015
Assistant bat biologist responsible for performing sensitive species evaluations on a proposed crude oil pipeline crossing the states of Iowa and Illinois. The project included habitat assessments for the northern long-eared bat, Indiana bat, eastern massasauga and eastern prairie-fringed orchid. Assisted another permitted biologist with acoustic bat surveys followed by netting, telemetry, and emergence surveys for threatened and endangered bats.
Approximate time: 10 netting survey nights, 15 nights of acoustics, 5 Indiana bats and 3 northern long-eared bats captured

Bat Telemetry Volunteer, Champaign, IL, Aug. 2014
Assistant bat biologist for netting and telemetry study. Duties: Capture, handle, and identify bats of Illinois, including Indiana bat, little brown bat, northern long-eared bat, red bat, evening bat, and big brown bat. Attach radio transmitters to multiple Indiana bats and northern long-eared bats. Track bats using radio telemetry. Use acoustic detectors to monitor bat activity. *Approximate time: 4 net survey nights, 3 northern long-eared bats captured*

Graduate Research Assistant, Southern Illinois University, Carbondale, IL, Aug. 2012 to Dec. 2014
Assistant bat biologist for netting surveys and **lead bat biologist** for acoustic surveys. Duties: Capture, handle, identify, and band bats of southern Illinois, including Indiana bat, northern long-eared bat, gray bat, little brown bat, southeastern bat, evening bat, big brown bat, tricolored bat, and red bat. Collect bat feces for diet analysis and perform acoustic bat surveys. Monitor bat activity using acoustic bat detectors, bat identification software, and qualitative ID. Design a large-scale experiment to test the strength of crop pest suppression by bats. *Approximate time: 10 net survey nights, 100+ nights of acoustics*, *2 Indiana bats and 2 northern long-eared bats independently identified*

Bat Survey Technician, Sanders Environmental, Belefonte, PA, May 2010 to Aug. 2010
Assistant bat biologist for netting surveys. Duties: Capture, handle, and identify bats of Pennsylvania and West Virginia, including northern long-eared bat, little brown bat, big brown bat, red bat, hoary bat, Rafinesque's big-eared bat, and Virginia big-eared bat. *Approximate time: 60 net survey nights, 10 northern long-eared bats captured*

BAT HIBERNACULA SURVEYS
Fall Swarm Survey Volunteer, Great Scott Cave and Pilot Knob Mine, MO, October 2019
Assistant bat biologist for fall swarm surveys at two major Indiana bat and gray bat hibernacula. Duties: set up harp traps, capture, handle, and identify Indiana bat, little brown bat, gray bat, and eastern small-footed bat. *Approximate time: 8 hrs, 200+ Indiana bats and 16 gray bats independently identified*

Hibernacula Survey Volunteer, Wolf River Cave, TN, March 2014
Assistant bat biologist for hibernaculum survey. Duties: Capture, handle, identify, and WNS-swab Indiana bat, little brown bat, northern long-eared bat, and tricolored bat in the second largest Indiana bat hibernaculum in Tennessee. Observe many species of hibernating bats, including Rafinesque's big-eared bat and gray bat. *Approximate time: 6 hrs, 12 Indiana bats and 10 northern long-eared bats independently identified*

Hibernacula Survey Volunteer, Blackball Mine, IL, Dec. 2013
Assistant bat biologist for hibernaculum survey. Capture and transport hibernating big brown bats for a lab-based experiment. Visually identify and count hibernating bats, including big brown bat, tricolored bat, northern long-eared bat, little brown bat, and Indiana bat. *Approximate time: 6 hrs*

Hibernacula Survey Volunteer, Shawnee National Forest, IL, Feb. 2013
Assistant bat biologist for hibernaculum survey. Conduct a winter mine survey. Capture and transport hibernating big brown bats for a lab-based experiment. Visually identify and count

hibernating bats, including big brown bat, Rafinesque's big-eared bat, northern long-eared bat, southeastern bat, gray bat, and Indiana bat.
Approximate time: 6 hrs

EMPLOYMENT

2015-Present **Staff Environmental Scientist, Burns & McDonnell**, Kansas City, MO
As a bat biologist, supervise and conduct threatened and endangered bat surveys, including habitat assessments, acoustic surveys, mist-netting, radio-tracking, and roost emergence counts.
Conduct habitat assessments and consultations assessing the impacts of proposed infrastructure projects on a variety of protected species across the U.S.
Write Bird and Bat Conservation Strategies for wind energy facilities, analyzing ecological data and providing recommendations regarding best management practices to avoid impacts to bird and bat populations.

2012-2014 **Graduate Research Assistant, Southern Illinois University**, Carbondale, IL
Duties: Capture, handle, identify, and band bats of southern Illinois, including Indiana bat, northern long-eared bat, little brown bat, gray bat, southeastern bat, Rafinesque's big-eared bat, evening bat, big brown bat, tricolored bat, and eastern red bat. Collect bat feces for diet analysis and perform acoustic bat surveys. Monitor bat activity using acoustic bat detectors, bat identification software, and qualitative ID. Design a large-scale experiment to test the strength of crop pest suppression by bats. Assist surveys for bat populations and white-nose syndrome in caves and reclaimed mines of Illinois and Tennessee.

2012 **Research Technician, Virginia Tech**, Vermillion, SD
Duties: Capture and band federally threatened Piping Plovers and federally endangered Least Terns.

2010-2012 **Research Technician, Kansas State University**, Manhattan, KS
Duties: Conduct surveys for fish and aquatic macroinvertebrates across KS and NM, identify invertebrates in the lab, and lead a study on the diet of predacious macroinvertebrates from the Gila River, NM.

2010 **Research Technician, Sanders Environmental**, Belefonte, PA
Duties: Capture, handle, and identify bats of Pennsylvania and West Virginia, including northern long-eared bat, little brown bat, big brown bat, red bat, hoary bat, Rafinesque's big-eared bat, and Virginia big-eared bat. Apply forearm bands to several species, including Virginia big-eared bat. Affix radio transmitters and conduct radiotelemetry on multiple species, including Rafinesque's big-eared bat.

PUBLICATIONS

Maine, J. and J. Boyles. 2015. Bats initiate vital agroecological interactions in corn. *Proceedings of the National Academy of Sciences.* 112 (40): 12438-12443

Maine, J. and J. Boyles. 2015. Land cover influences dietary specialization of insectivorous bats globally. *Mammal Research*. 60 (4): 343-351

Maas, B., D. S. Karp, S. Bumrungsri, K. Darras, D. Gonthier, J. C.-C. Huang , C. A. Lindell, **J. Maine**, L. Mestre, N. L. Michel, E. B. Morrison, I. Perfecto, S. M. Philpott, C. H. Sekercioglu, R. M. Silva, P. Taylor, T. Tscharntke, S. A. Van Bael, C. J. Whelan, and K. Williams-Guillén. 2015. Bird and Bat Predation Services in Tropical Forests and Agroforestry Landscapes. *Biological Reviews*.

Neiles, B., C. S. Carey, A. Araujo, D. Burkhart, L. J. Kirschman, B. LaBumbard, S. LaGrange, **J. Maine**, A. M. Rombenso, M. N. Wood, and J. G. Boyles. 2015. Writing Your Way into High Impact Factor Journals. *Bulletin of the Ecological Society of America.* 96 (2): 312-316.

Maine, J., J. Whitney, and K. Gido. 2014. Dietary Overlap of Invertivorous Fishes and Macroinvertebrates in the Gila River, NM. *The Southwestern Naturalist*. 59 (2): 292-295.

REFERENCES

James (Gene) Gardner
Senior Environmental Scientist
Burns & McDonnell
573-353-2726
jegardner@burnsmcd.com

Dr. Justin Boyles
Assistant Professor
Southern Illinois University
618-453-6945
jgboyles@siu.edu

BROOKE A. HINES, MS CWB

ENVIRONMENTAL PROJECT MANAGER



Brooke is an environmental project manager with extensive experience in ESA Section 7 consultation, NEPA documentation, CWA coordination, and federal, state, and municipality environmental permitting. Lead senior biologist for effects analysis on listed bat species, habitat assessments, presence/absence surveys, and federal and state species-specific studies. Brooke is co-author of acoustic publications focusing on presence/absence methodology.

EDUCATION

- MS, Biology, Applied Ecology
- BS, Natural Resources Wildlife Management

REGISTRATIONS

- ESA Section 10 T&E Recovery Permit/USFWS
- Certified Wildlife Biologist/The Wildlife Society
- Remote Pilot sUAS Part 107 Certification/FAA

<1 YEARS WITH BURNS & MCDONNELL

21 YEARS OF EXPERIENCE

Brooke has over 21 years of experience with the ESA Section 7 consultation for threatened and endangered bat species, in public and private sectors. She has extensive experience with habitat and biological assessments, writing state and federal guidance for bat surveys, and coordination with state and federal agencies on policy implementation. She also has extensive experience with bat population estimates which include state-wide bat hibernacula and summer emergence counts and acoustic surveys. Brooke has also overseen numerous research studies on White-nose Syndrome and co-authored acoustic publications. Brooke has worked on numerous ecological and energy development projects throughout the U.S. focusing on federally endangered bats.

Ms. Hines' published research focuses on acoustic methodology and probability of detection. She has extensive experience conducting bat habitat surveys, presence/absence surveys including mist-net, acoustic, and harp traps, and telemetry surveys. Surveys focus on federally-listed species that include the Indiana bat (*Myotis sodalis*), gray bat (*M. grisescens*), northern long-eared bat (M. septentrionalis), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*). Ms. Hines holds a U.S. Fish and Wildlife Service (USFWS) Section 10(A)(1)(a) recovery permit (#TE31355B-3) to handle Indiana bats, gray bats, northern long-eared bats, Virginia big-eared bats, and Ozark big- eared bats (*C. t. ingens*).

Ms. Hines is familiar with multi-agency coordination, data management, technical report writing, and field crew management. Her experience includes many ecological field techniques, including habitat assessments, bridge surveys, mist-netting, cave, and portal surveys, as well as acoustic monitoring and bat call ID and analysis. Ms. Hines was a member of the writing team for the first USFWS Range-wide Indiana bat Summer Guidelines (2014) and has extensive experience with qualitative identification of bat calls to manually verify acoustic software outputs.



CREATE AMAZING.

Burns & McDonnell Atlanta Regional Office
3650 Mansell Road, Suite 300
Alpharetta, GA 30022
www.burnsmcd.com

APPENDIX E
AGENCY CONSULTATIONS

TENNESSEE VALLEY AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

April 13, 2021

Mr. Barry White
Director
Mississippi Department of Archives and History
Historic preservation Division
Post Office Box 571
Jackson, Mississippi 39205-0521

Dear Mr. White:

TENNESSEE VALLEY AUTHORITY (TVA), POWER PURCHASE AGREEMENT (PPA), GOLDEN TRIANGLE SOLAR, SECOND PHASE LOWNDES COUNTY, MISSISSIPPI (TVA TRACKING NUMBER – CID 79857) (33.39170, -88.61037)

TVA proposes to enter into a PPA with Orgis Energy for an approximately 150 megawatt (MW) solar photovoltaic (PV) generating facility and a 50 MW Battery Energy Storage System (BESS) in Lowndes County, Mississippi. The project would be located within seven parcels totaling 1,520 acres. TVA recommends that the area of potential effects (APE) be considered to be the area of proposed ground-disturbance, where physical effects could occur including the PV facility, associated access routes, interconnect, and the BESS, as well as areas within a half-mile radius of the project within which the project would be visible, where visual effects on aboveground resources could occur. In order to obtain maximum flexibility in design to avoid both cultural and environmental resources, the archaeological survey area consists of the entire 1,520 acres.

Orgis Energy contracted with Burns & McDonnell to conduct a Phase I Cultural Resources survey. For your review, please find Burn & McDonnell's scope of work (SOW) for the Phase I Cultural Resources survey enclosed. Pursuant to 36 CFR § 800.4(b)(1), TVA finds that the SOW presented here represents a reasonable and good faith effort to carry out identification efforts.

By this letter, TVA is initiating consultation regarding the proposed undertaking. TVA is proposing to conduct a Phase I Cultural Resources survey of the APE as described in the enclosed SOW. In addition, TVA is proposing to have a kick-off meeting with all parties prior to starting fieldwork. Please let us know your availability.

Pursuant to 36 C.F.R. Part 800.3(f)(2), TVA is initiating consultation with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places.

Please contact Michaelyn Harle by email at mharle@tva.gov with your comments.

Sincerely,



Clinton E. Jones
Manager
Cultural Compliance

MSH:ABM
Enclosures

INTERNAL COPIES NOT TO BE INCLUDED WITH OUTGOING LETTER:

S. Dawn Booker, BR 2C-C
J. Taylor Cates, BR 2C-C
Michael C. Easley, BR 2C-C
Michaelyn S. Harle, WT 11C-K
Brandon J. Hartline, BR 2C-C
Susan R. Jacks, WT 11C-K
Dana M. Nelson, WT 11C-K
Rebecca C. Tolene, WT 7B-K
William B. Wells, III BR 2C-C
W. Douglas White, WT 11C-K
ECM, ENVRecords

TENNESSEE VALLEY AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

January 28, 2022

Mr. Barry White
Director
Mississippi Department of Archives and History
Historic Preservation Division
Post Office Box 571
Jackson, Mississippi 39205-0521

Dear Mr. White:

TENNESSEE VALLEY AUTHORITY (TVA), POWER PURCHASE AGREEMENT (PPA), GOLDEN TRIANGLE SOLAR, SECOND PHASE, LOWNDES COUNTY, MISSISSIPPI (TVA TRACKING NUMBER – CID 79857) (33.39170, -88.61037) (MDAH PROJECT LOG #04-063-21)

In a letter dated March 11, 2021, TVA initiated consultation with your office regarding TVA's proposal to enter into a PPA with Origis Energy for an approximately 150 megawatt (MW) solar photovoltaic (PV) generating facility and a 50 MW Battery Energy Storage System (BESS) in Lowndes County, Mississippi. The project would be located within seven parcels totaling 1,520 acres.

TVA, in consultation, determined that the area of potential effects (APE) to be the area of proposed ground disturbance, where physical effects could occur, including the PV facility, associated access routes, interconnect, and the BESS, as well as areas within a half-mile radius of the project within which the project would be visible, where visual effects on aboveground resources could occur. To obtain maximum flexibility in design to avoid both cultural and environmental resources the archaeological survey area consisted of the entire 1,520 acres.

Origis Energy contracted with Burns and McDonald to conduct the Phase I Cultural Resources survey in accordance with the scope of work that was provided to your office. The resulting report titled, *Phase 1 Cultural Resources Survey for the Golden Triangle II Solar Farm Project, Lowndes County, Mississippi* can be downloaded.

Please note that a portion of the survey area was included in the original Phase I survey, as described in the Golden Triangle I addendum report we provided previously (*Phase 1 Cultural Resources Survey for the Golden Triangle I Solar Farm Project, Lowndes County, Mississippi Addendum Report*).

Burns and McDonald identified 12 archaeological sites and 15 isolated finds as a result of the current survey.

- Site 22LO1100, is a Late Archaic through Late Woodland period possible camp site. Burns and McDonald recommends site 22LO1100 remain unassessed for inclusion in the National Register of Historic Places (NRHP); the phase I survey indicated the potential presence of intact deposits, though no such deposits were identified.
- Sites 22LO1114 and 22LO1098 are historic scatters with intact features. Burns and McDonald recommend both 22LO1114 and 22LO1098 remain unassessed for inclusion in the NRHP.
- Site 22LO1117 is an extant portion of the Smith Oaks Harness Horse Racing Track. The 0.5-mile dirt track was constructed by Thomas Wilburn II in the late 1940s or early 1950s. No artifacts were identified in association with the racetrack. Burns and McDonald recommend 22LO1117 eligible for inclusion in the NRHP under Criteria A and B.
- The remaining archaeological sites represent late nineteenth to early twentieth century artifact scatters. While some of these sites may represent tenant or sharecropper occupations, few artifacts were recovered, no intact deposits were identified, and the sites have been affected by ground disturbance. TVA finds that the sites do not retain sufficient integrity to be considered eligible for listing on the NRHP.

The survey resulted in the documentation of 25 architectural resources on seven properties within the visual APE. An additional eight architectural resources (Resources 15, 41a, 41b, 42, 43, and 44a-44c) were previously evaluated as part of the Golden Triangle I Solar Project and were determined, in consultation with your office, not eligible for NRHP listing (Shaver et. al 2021). Two properties were previously identified during the additional parcel in the addendum report for Golden Triangle I.

- Resource 02 (46 in the addendum report) is a collection of structures associated with the Smith Oaks Plantation. Burns and McDonald recommend, and TVA agrees, that one of the structures, a circa 1880s former commissary/store building, be considered eligible for the NRHP. As sufficient analysis of the Smith Oaks Cemetery has not been done, the cemetery should be considered unassessed for NRHP eligibility. Per our discussion in our December consultation letter for Golden Triangle I, TVA finds that both resources' integrity of setting has been reduced due to the loss of the original dwelling and associated agricultural buildings. TVA finds that although there would be a visual effect to the Smith Oakes Commissary and Cemetery the effect would not be adverse.
- Resource 07 (Resource 47 in the addendum report), a former African American cemetery identified through archival information, was not identified during the field study. The cemetery warrants additional NRHP eligibility analysis and should be considered unassessed. The cemetery is located outside the project footprint. The viewshed to the project area is obscured by existing pond berms and the undertaking would not have an effect to this property should it be determined eligible.
- Resource 05 is a collection of structures associated with the former Oakland Plantation. Oakland Plantation includes a circa 1840s dwelling (05a), a circa 1975 barn (05b), two small

early-twentieth-century buildings (05c and 05d) located south of the dwelling, and a non-historic-age building behind the dwelling that appears to be a secondary residence. Burns and McDonald recommends Resource 05a eligible for NRHP listing under Criteria A and C, and Resources 05c and 05d are recommended as contributing resources. Resource 5 is located approximately 0.31 miles outside of the project footprint and would not be directly affected by the undertaking. The viewshed of Resource 05a, c, and d is heavily obscured by dense vegetation and would not have an adverse visual effect to historic properties.

- Burns and McDonald recommends Resources 01, 03, 04, and 06 not eligible for the NRHP due to lack of architectural distinction, inability to associate the property with significant events or persons, and/or architectural integrity.

TVA has read the enclosed report and agrees with the recommendations of the authors. In order to avoid adverse effects to unassessed sites (22LO1100, 22LO1114, 22LO1098, 22LO1117), the boundaries of the sites, along with a 100-foot buffer, have been added to the "exclusion areas" within the project area. TVA will avoid these exclusion areas and will not allow, in these areas, any development, disturbance, or other construction activities associated with the development of the project or future activities associated with the operation and maintenance of the solar array. In order to ensure avoidance of these sites during the life of the project, Origis and TVA will sign the attached draft legal agreement.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding properties within the survey area that may be of religious and cultural significance to them and eligible for the NRHP.

Pursuant to 36 CFR Part 800.5(c) we are notifying you of TVA's finding of no adverse effect, providing the documentation specified in § 800.11(e); and inviting you to review the finding. Also, we are seeking your agreement with TVA's eligibility determinations and finding that the undertaking as currently planned will have no adverse effects on historic properties.

If you have any questions, please contact Michaelyn Harle by email, mharle@tva.gov.

Sincerely,

James W. Osborne, Jr.
Manager
Cultural Compliance

MSH:ABM
Enclosures

References Cited:

Shaver, Douglas, Brandy Harris, Kim House, and Jess Kepka

2021 *Phase I Cultural Resources Survey for the Proposed Golden Triangle Solar Farm Project, Lowndes County, Mississippi.* Prepared by Burns and McDonnell Engineering Company, Inc., Kansas City, Missouri, for Origis Energy.

INTERNAL COPIES NOT TO BE INCLUDED WITH OUTGOING LETTER:

S. Dawn Booker, BR 2C-C
J. Taylor Cates, WT 11C-K
Michael C. Easley, BR 2C-C
Michaelyn S. Harle, WT 11C-K
Brandon J. Hartline, BR 2C-C
Susan R. Jacks, WT 11C-K
Dana M. Nelson, WT 11B-K
Rebecca C. Tolene, WT 11C-K
William B. Wells, III BR 2C-C
W. Douglas White, WT 11C-K
ECM, ENVRecords

MDAH
MISSISSIPPI DEPARTMENT OF
ARCHIVES & HISTORY

P.O. Box 571
Jackson, MS 39205-0571
601-576-6850
mdah.ms.gov

February 17, 2022

Mr. James W. Osborne, Jr,
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

RE: Tennessee Valley Authority (TVA), Origis Energy Solar (Golden Triangle I) (33.45111, -88.62775) (TVA Tracking Number – CIDV 79483). MDAH Project Log 02-133-22 (12-139-21, 05-135-20), Lowndes County, Mississippi

Dear Mr. Osborne:

We have received your February 15, 2022 communication regarding the Golden Triangle II Solar Farm Project, Lowndes County, Mississippi in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800.

MDAH concurs with the archaeological and architectural resource eligibility determinations and the finding that the undertaking as currently planned will have no adverse effects on historic properties. Additionally, MDAH concurs with the proposed temporary barriers to avoid effects to significant archaeological sites. Please consider this comment letter as conclusion of the Mississippi SHPO's consultation requirements for this undertaking.

If you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

Barry White
Deputy State Historic Preservation Officer

FOR: Katie Blount
State Historic Preservation Officer

Cc: Michaelyn Harle – TVA
Amy McCampbell - TVA

Board of Trustees: Spence Flatgard, president | Hilda Cope Povall, vice president | Kimberly L. Campbell | Nancy Carpenter | Betsey Hamilton | Web Heidelberg | Edmond E. Hughes Jr. | Mark E. Keenum | Carter Burns