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MIDWAY-SOUTH MACON AND SOUTH MACON-DEKALB 161-KV TRANSMISSION LINES

DRAFT ENVIRONMENTAL ASSESSMENT

Kemper, Noxubee and Winston Counties, Mississippi

EAXX-455-00-000-1732199771

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Acronyms, Abbreviations, and Glossary of Terms Used

acre	A unit measure of land area equal to 43,560 square feet
access road	A dirt, gravel, or paved road that is either temporary or permanent, and is used to access the right-of-way and transmission line structures for construction, maintenance, or decommissioning activities
ACHP	Advisory Council on Historic Preservation
APE	Area of potential effect
BMP	Best management practice or accepted construction practice designed to reduce environmental effects
CAA	Clean Air Act
circuit	A section of conductors (three conductors per circuit) capable of carrying electricity to various points
conductors	Cables that carry electrical current
CEQ	Council on Environmental Quality
CWA	Clean Water Act
danger tree	A tree located outside the right-of-way that could pose a threat of grounding a line if allowed to fall near a transmission line or a structure
EA	Environmental Assessment
easement	A legal agreement that gives TVA the right to use property for a purpose such as a right-of-way for constructing and operating a transmission line
EJScreen	An environmental justice screening and mapping tool
EIS	Environmental Impact Statement
EMF	Electromagnetic field
endangered species	A species in danger of extinction throughout all or a significant part of its range
EO	Executive Order
EPA	United States Environmental Protection Agency
ephemeral stream	Watercourses or ditches that only have water flowing after a rain event; also called a wet-weather conveyance
ESA	Endangered Species Act
FHWA	Federal Highway Administration
feller-buncher	A piece of heavy equipment that grasps a tree while cutting it, which can then lift the tree and place it in a suitable location for disposal; this equipment is used to prevent trees from falling into sensitive areas, such as a wetland
FONSI	Finding of No Significant Impact

GIS	Geographic Information System
groundwater	Water located beneath the ground surface in the soil pore spaces or in the pores and crevices of rock formations
guy	A cable connecting a structure to an anchor that helps support the structure
HUC	Hydrologic Unit Code
hydric soil	A soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop conditions of having no free oxygen available in the upper part
hydrophytic vegetation	Aquatic and wetland plants that have developed physiological adaptations allowing a greater tolerance to saturated soil conditions including with limited or absence of oxygen
IPaC	The U.S. Fish and Wildlife Services' "Information for Planning and Conservation" database tool that allows users to identify managed resources quickly and easily.
kV	Symbol for kilovolt (1 kV equals 1,000 volts)
load	That portion of the entire electric power in a network consumed within a given area; also synonymous with "demand" in a given area
LPC	Local power company
MW	Megawatt is a unit of power equal to one million watts, especially as a measure of the output of a power station
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NPS	National Park Service
NSCR	Non-site Cultural Resources
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OPGW	Fiber-optic ground wire
outage	An interruption of the electric power supply to a user
PEIS	Programmatic Environmental Impact Statement
PI	Point of intersection at which two straight transmission line sections intersect to form an angle
riparian	Related to or located on the banks of a river or stream
ROW	Right-of-way, a corridor containing a transmission line
runoff	That portion of total precipitation that eventually enters a stream or river

S.	South
SHPO	State Historic Preservation Officer
SMZ	Streamside management zone
structure	A pole or tower that supports a transmission line
substation	A facility connected to a transmission line used to reduce voltage so that electric power may be delivered to a local power distributor or user
surface water	Water collecting on the ground or in a stream, river, lake, or wetland; it is naturally lost through evaporation and seepage into the groundwater
switch	A device used to complete or break an electrical connection
SWPPP	Stormwater Pollution Prevention Plan
threatened species	A species likely to become endangered within the foreseeable future
TNBWG	Tennessee Bat Working Group
TRAM	Tennessee Rapid Assessment Method developed to rapidly determine the condition of a wetland in the field based solely on hydrogeomorphic classification meant to be a “snapshot” of current condition based on on-site and external influences and variables relative to a reference standard. Information on the condition of the wetland is then used to evaluate a proposed impact justification and assess mitigation needs.
TVA	Tennessee Valley Authority
U. S.	United States
USACE	U. S. Army Corps of Engineers
USCB	U. S. Census Bureau
USDA	U. S. Department of Agriculture
USFS	U. S. Forest Service
USFWS	U. S. Fish and Wildlife Service
USGS	U. S. Geological Survey
wetland	A marsh, swamp, or other area of land where the soil near the surface is saturated or covered with water, especially one that forms a habitat for wildlife
WHO	World Health Organization
WWC	Wet-weather Conveyance. See definition above for ephemeral stream.

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CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1. Proposed Action – Improve Power Supply

The Tennessee Valley Authority (TVA) proposes to improve the existing power supply in the Starkville and eastern Mississippi areas by constructing two separate transmission lines totaling about 52.2 miles. The proposed project would utilize about 363 acres of existing right-of-way (ROW) and approximately 268 acres of new ROW. Both the proposed Midway-South (S.) Macon 161-kV Transmission Line and the S. Macon-DeKalb 161-kV Transmission Line would be mostly constructed using single-pole structures. However, about 5.5 miles of the proposed S. Macon-DeKalb 161-kV Transmission Line would be built using two-pole, double-circuit, steel structures.

The first phase of the proposed project would include constructing the approximate 19.4-mile Midway-S. Macon 161-kV Transmission Line to connect TVA's existing Midway 161-kV Substation located in Winston County and TVA's existing S. Macon 161-kV Substation in Noxubee County (see Figure 1-1). This transmission line would utilize about 13.5 miles of the existing 100-foot-wide ROW totaling 163 acres along the retired Midway-Macon 46-kV Transmission Line. The remaining 5.9 miles would be constructed on a new 100-foot-wide ROW totaling 71 acres.

The second phase of the proposed project would utilize approximately 200 acres of existing ROW and 197 acres of new ROW for the construction of the S. Macon-DeKalb 161-kV Transmission Line (see Figure 1-2). This 32.8-mile transmission line would use about 14.4 miles of existing 75-foot-wide ROW which would be expanded to 100-foot-wide, 3.5 miles of existing 100-foot-wide ROW, and 14.9 miles of new 100-foot-wide ROW. This transmission line would provide a second connection between TVA's existing S. Macon 161-kV Substation located in Noxubee County and TVA's existing DeKalb 161-kV Substation in Kemper County. Additionally, this line would also provide a delivery point to East Mississippi Electric Power Association's (EMEPA) upgraded Scooba 161-kV Substation in Kemper County.

TVA would also install new fiber optic ground wire on the new transmission line to facilitate communications with the TVA network. The TVA map board displays would be updated to reflect this work. The scheduled in-service date for the Midway-S. Macon 161-kV Transmission Line is August 2026. The S. Macon-Dekalb 161-kV Transmission Line is targeted for May 2028.

1.2. Need for the Proposed Action

TVA plans its transmission system according to industry-wide standards established by the North American Electric Reliability Corporation (NERC). Those standards state that the TVA transmission system must be able to survive NERC defined contingency events while continuing to serve customer loads[1] with adequate voltage and no overloaded facilities while maintaining adequate transmission line clearances as required by the National Electric Safety Code (NESC).

[1] "Load" is defined as that portion of the entire electric power in a network that is consumed within a given area. The term is synonymous with "demand" in a given area.

The Starkville area currently receives power from three long TVA source lines[2] with large numbers of customer connection points. As a result, TVA currently experiences limited operational flexibility in this area, especially related to planned maintenance and project work on the existing source lines, due to the current system configuration causing risk to customer reliability.

The increasing power loads caused by commercial and residential growth in the area could result in overloaded transformers and other electrical equipment damage or failure. Overloading of a transmission line can cause alternating heating and cooling of the conductor material, thus weakening the transmission line over time. Overloading can also cause a transmission line to sag[3] in excess of design criteria, resulting in inadequate clearance between the transmission line and the ground. If a transformer and/or transmission line fail, the result is a power outage.

The construction and operation of the proposed transmission lines would

- increase power reliability in the area,
- add TVA operational flexibility and efficiency for taking maintenance and construction outages in lower Mississippi,
- eliminate voltage stability issues in the Starkville area when nearby TVA transmission lines are out of service,
- strengthen resiliency of the TVA transmission system with an additional transmission line to serve the southern region of the TVA service area in Mississippi, and
- minimize risk during planned outages required for work associated with TVA's strategic fiber initiative.

Additionally, the Kemper CT site currently experiences megawatt constraints during outages to source lines to avoid overloading the remaining active source lines. The proposed project would increase opportunities for Kemper Combustion Turbine (CT) Plant to generate and provide power to the local load.

Lastly, the existing Scooba 46-kV Substation is currently served from a single, radial[4] line. A new transmission line would increase the power capacity in EMEPA's service territory for economic development and would support potential industrial site development in the area.

1.3. Decisions to be Made

The primary decision before TVA is whether to improve the existing power supply by constructing, operating, and maintaining approximately 52.2 miles of new transmission lines. TVA would also install fiber-optic ground wire (OPGW) on the new transmission lines to facilitate communications with the TVA network. If the proposed transmission lines are to be built, other secondary decisions are involved. These include the following considerations:

[2] A source line is a transmission line acting as a conduit that allows power to flow from a power source to a location where the load demand is needed.

[3] In Transmission lines, the sag is considered as the vertical distance between two points of support of the transmission towers and the lowest peak point of transmission line conductor wire.

[4] A radial line consists of a single line from the power source to a substation or customer.

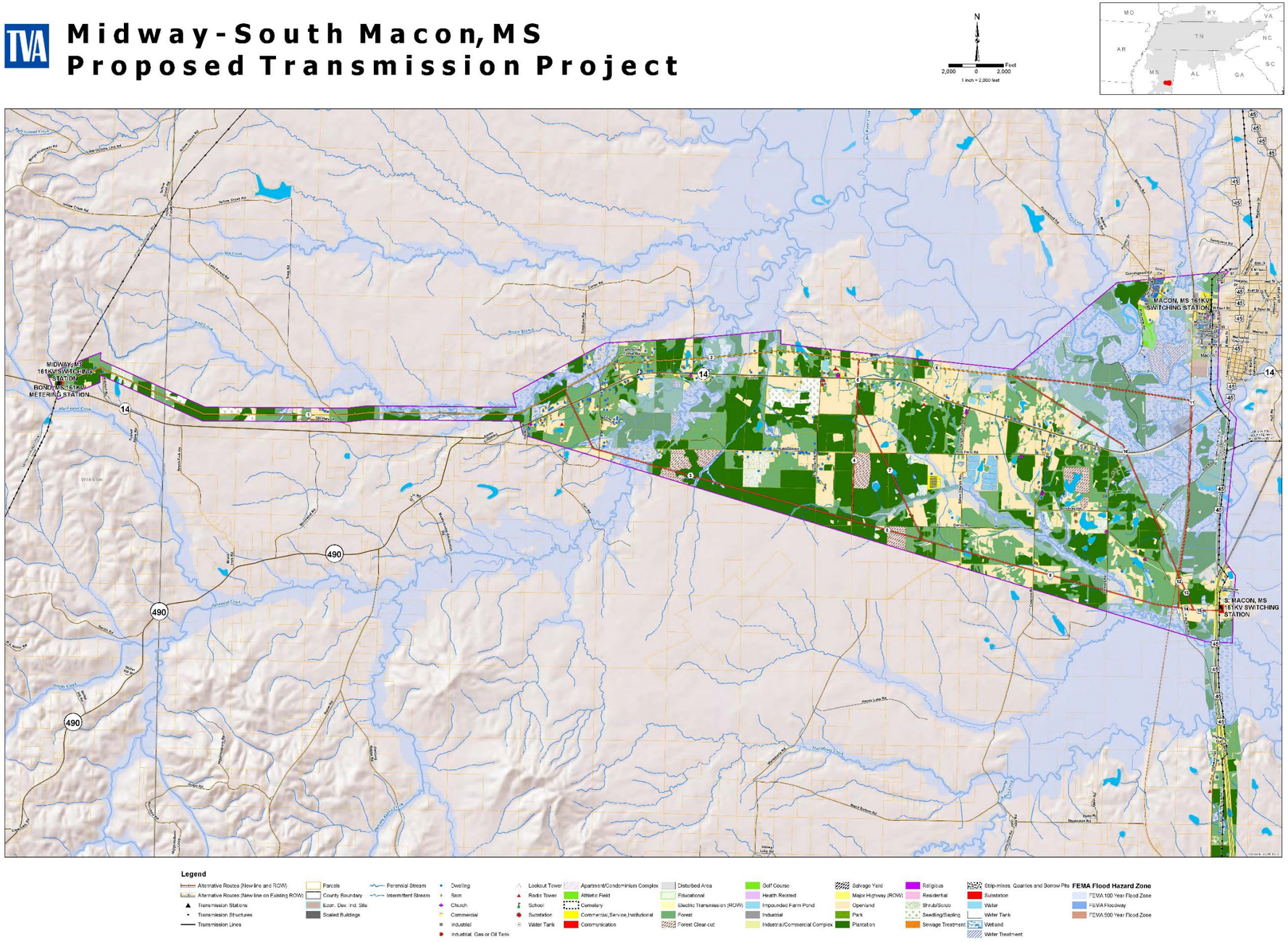

Figure 1-1. Preferred Transmission Line Route to Connect Midway 161-kV Substation in Winston County and South Macon 161-kV Substation in Noxubee County, Mississippi

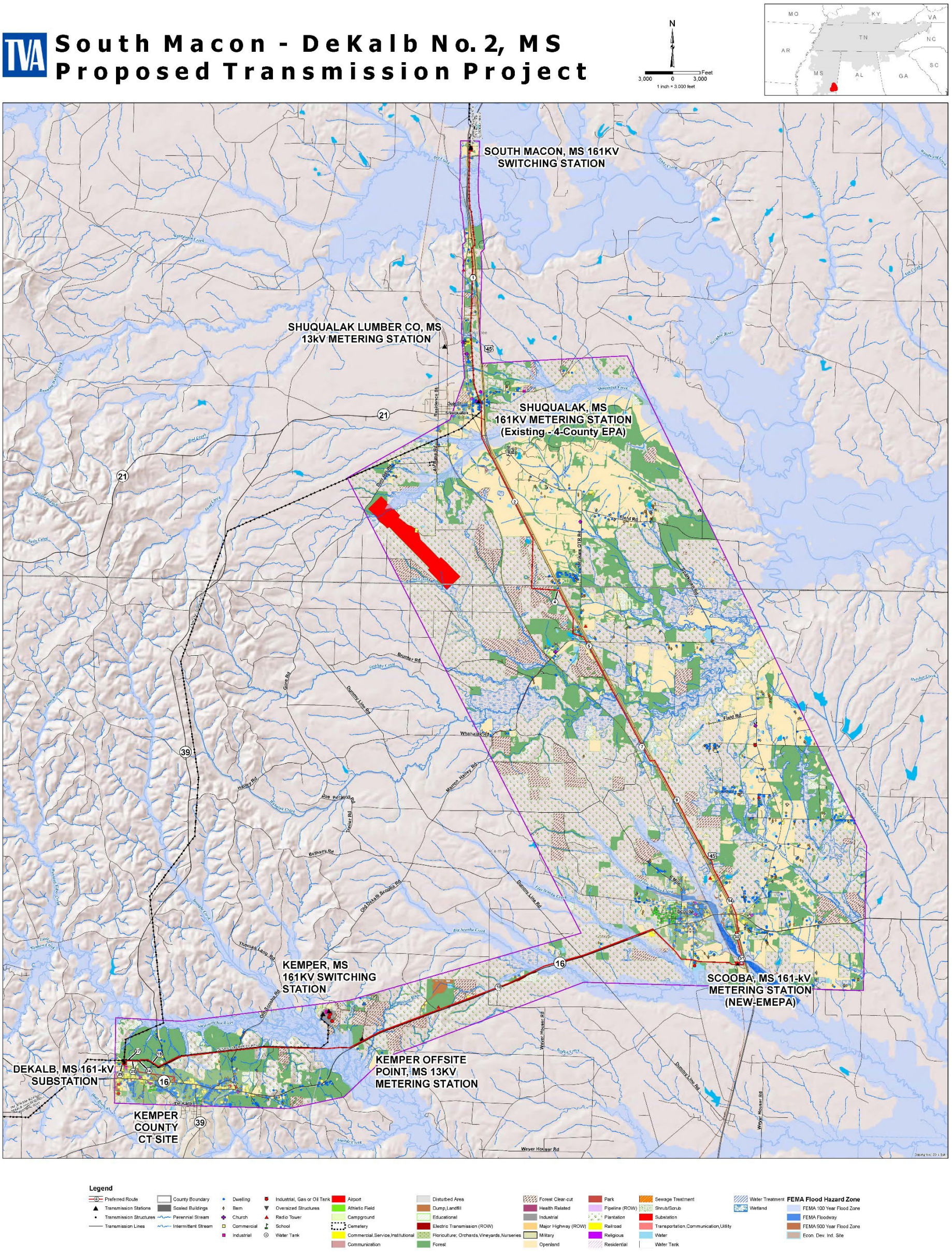

Figure 1-2. Preferred Transmission Line Route to Provide a Second Connection Between South Macon 161-kV Substation in Noxubee County and DeKalb 161-kV Substation in Kemper County and a Delivery Point to East Mississippi Electric Power Association's Upgraded Scooba 161-kV Substation in Kemper County, Mississippi

- Timing of the proposed improvements;
- Most suitable route for the proposed transmission line;
- Modifications/upgrades TVA would need to do at some of its existing substations to facilitate the operation of the two new transmission lines; and
- Determination of any necessary mitigation and/or monitoring to meet TVA standards and to minimize the potential for damage to environmental resources.

A detailed description of the alternatives is provided in Section 2.1.

1.4. Related Environmental Reviews or Documentation

In 2019, TVA completed the 2019 Integrated Resource Plan (IRP) and the associated environmental impact statement (EIS) (TVA 2019a). These documents provide direction on how TVA can best deliver clean, reliable, and affordable energy in the Valley over the next 20 years, and the associated EIS looks at the natural, cultural, and socioeconomic impacts associated with the IRP. TVA's IRP is based upon a "scenario" planning approach that provides an understanding of how future decisions would play out in future scenarios. In September 2024, TVA released a new Draft IRP for public review and comment. The 2019 IRP remains valid and guides future generation planning until TVA's subsequent IRP is issued as Final with any new or modified recommendations.

In 2019, TVA released a Transmission System Vegetation Management Programmatic Environmental Impact Statement (PEIS), which is incorporated by reference (TVA 2019b). This review more broadly represented a comprehensive analysis of management activities and potential environmental impacts associated with TVA's vegetation management program within the TVA power service area. The analysis considered various vegetation management methods and tools. TVA issued a Record of Decision on October 18, 2019, identifying its preferred vegetation management program alternative as a condition-based control strategy with a goal of maintaining the ROWs in a meadow-like end-state (84 FR 55995).

On September 27, 2024, TVA released a final EA and FONSI for public comment addressing its proposal to perform routine vegetation management on about one-third of its transmission system ROWs in each of its Fiscal Years (FY) 2025 and 2026 (TVA 2024a). TVA issued final EAs and FONSIs for similar proposals on November 9, 2020 (addressing FY 2021), on October 1, 2021 (addressing FYs 2022 and 2023), and October 19, 2023 (addressing FY24) (TVA 2020; TVA 2021; TVA 2023). The management of vegetation is needed to ensure the transmission system can continue to provide reliable power and to prevent outages related to incompatible vegetation. Site-specific effects were considered within twelve managed Sectors in areas that had been previously and continuously maintained on a recurring cycle. The EAs tiered from the PEIS which evaluated and analyzed TVA's vegetation management program (TVA 2019b).

1.5. Scoping Process and Public Involvement

TVA contacted the following federal and state agencies, as well as federally recognized Indian tribes, concerning the proposed project:

- Absentee Shawnee Tribe of Indians of Oklahoma
- Mississippi Band of Choctaw Indians

- Alabama-Coushatta Tribe of Texas
- Jena Band of Choctaw Indians
- Choctaw Nation of Oklahoma
- Coushatta Tribe of Louisiana
- Eastern Shawnee Tribe of Oklahoma
- National Park Service (NPS) – Natchez Trace Parkway
- United States Army Corps of Engineers (USACE)
- United States Fish and Wildlife Service (USFWS)
- Mississippi State Historic Preservation Officer (SHPO)

TVA developed a public communication plan that included a website with information about the project, a map of the alternative routes (Figures 1-3 and 1-4), and numerous feedback mechanisms. TVA held two open houses due to the large number of alternative routes, the length of and the distance between the two transmission lines, and the large number of property owners potentially affected by the proposed project.

TVA held an in-person open house for the proposed Midway-S. Macon 161-kV Transmission Line on November 21, 2019, in Macon, Mississippi. Invitations to attend were sent to 116 property owners who could potentially be affected by the project route alternatives, or had property near the route alternatives, along with public officials were invited to the virtual open house. The open house was attended by 58 people. Comments were accepted through December 23, 2019. TVA announced its preferred route for this transmission line in April 2020.

Due to Covid safety precautions and restrictions, TVA held a virtual open house for the proposed S. Macon-DeKalb 161-kV Transmission Line from December 3, 2020, through January 4, 2021. TVA invited 177 property owners representing about 302 parcels who could potentially be affected by the project route alternatives, or had property near the route alternatives, along with public officials to the virtual open house. TVA used local news outlets and notices placed in local newspapers to notify other interested members of the public of the open house. The virtual open house was attended by 23 people. The preferred location for the new line was selected from several options presented online at a virtual open house and announced in May 2021.

The virtual open house included 10 information stations, with content listed below:

- Station 1 - Welcome and website navigation instructions
- Station 2 - Need for Project including reasons for the improvement and the project benefits.
- Station 3 - Project information, the proposed project schedule, and the proposed transmission line route alternatives with alternative segments and possible routes (). (Project Maps as shown in Figure 1-2, Structure Photo)
- Station 4 – Interactive Geographic information system (GIS) application to show how the route might affect the property owner

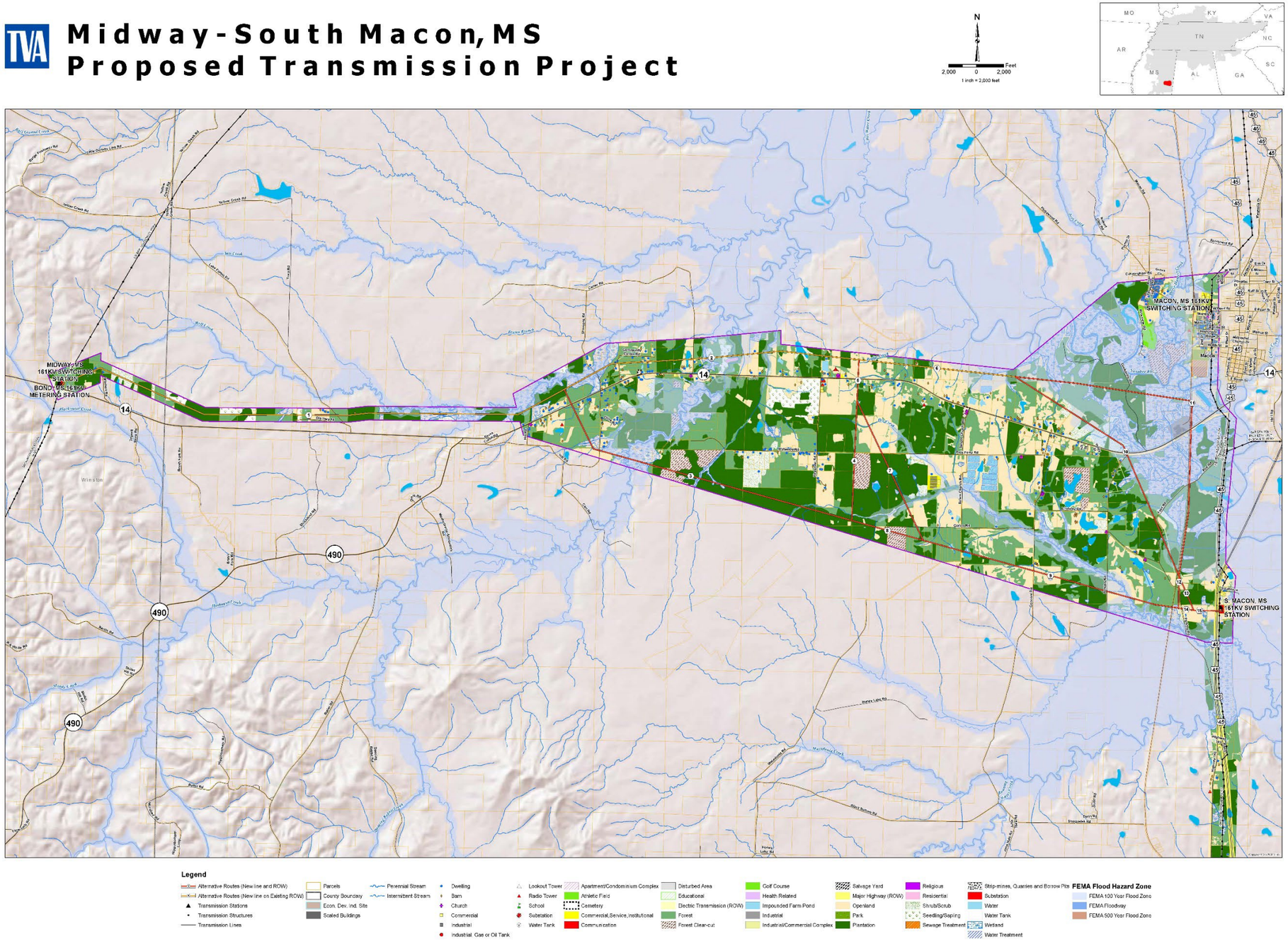

Figure 1-3. Proposed Transmission Line Segments Connecting TVA's Existing Midway 161-kV Substation in Winston County and South Macon 161-kV Substation in Noxubee County in Mississippi

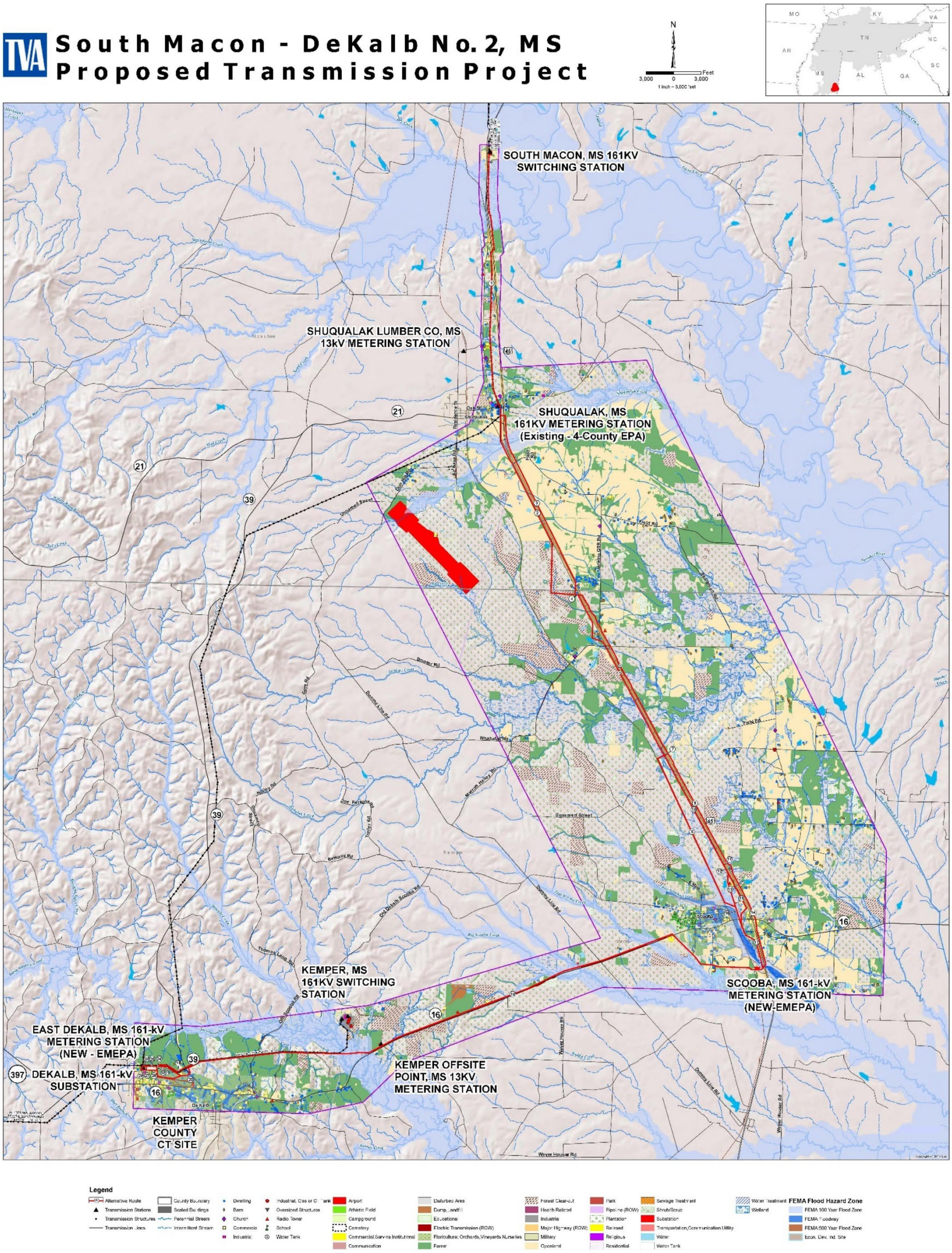

Figure 1-4. Proposed Transmission Line Routes to Connect TVA's Existing South Macon 161-kV Substation in Noxubee County and DeKalb 161-kV Substation in Kemper County, and to Provide a Delivery Point to East Mississippi Electric Power Association's Upgraded Scooba 161-kV Substation in Kemper County, Mississippi

- Station 5 - An explanation of TVA's transmission line Siting Process
- Station 6 - An explanation of the environmental considerations considered during the project including the Environmental Review process
- Station 7 - TVA's land and easement acquisition process.
- Station 8 - Frequently asked questions about the transmission system and an explanation of the transmission line construction process.
- Station 9 - TVA's Mission
- Station 10 - Thank you and Ask for Comments

Each of the stations provided opportunities for attendees to provide comments.

Maps for the S. Macon-DeKalb 161-kV Transmission Line showed a network of 180 alternative transmission line routes, comprised of 29 different line segments to the public for comment. The final number of route combinations that were considered in the final analysis was later modified as detailed in Section 2.4.3 to a total of 84 routes.

The interest of those who attended both the in-person, and the virtual open houses pertained mostly to the effects of the proposed transmission lines to the individual landowners' property and property values, concerns around impacts to already planned or future development potential, proximity to homes, deforestation, timber compensation, and impacts to streams. A toll-free phone number was provided to facilitate comments for those who did not want to submit comments through the virtual open house, email or U.S. mail.

As a result of information obtained following the announcement of the preferred route from both public and agency comments, as well as from environmental field surveys, TVA made additional route adjustments to the preferred transmission line route (Figure 1-1). These adjustments are described in Section 2.4.3.

TVA has developed a public communication plan that includes a website (TVA.com/nepa) for the draft EA. TVA has also used local news outlets and notices placed in the local newspapers to notify other interested members of the public of the draft EA for the proposed Midway-S. Macon and S. Macon-Dekalb 161-kV Transmission Lines.

The project website is intended to serve as the primary hub for distributing information to the public. Visitors to the page can navigate from the project website to other TVA websites for additional information pertaining to TVA's transmission system and current vegetation management. The website directs the public to submit scoping comments via email, mail, or an online comment form accessed from the project website

1.6. Issues to be Addressed

TVA prepared this draft EA to comply with the National Environmental Policy Act (NEPA) and regulations promulgated by the Council of Environmental Quality and TVA to implement NEPA. The draft EA investigates the construction, operation, and maintenance of two proposed new transmission lines as well as the purchase of ROW for this purpose or taking no action.

TVA has determined the resources listed below are potentially affected by the alternatives considered. These resources were identified based on internal scoping as well as comments received during the scoping period.

- Water quality (surface waters and groundwater)
- Aquatic ecology
- Vegetation
- Wildlife
- Endangered and threatened species and their critical habitats
- Floodplains
- Wetlands
- Aesthetic resources (including visual and noise)
- Archaeological and historic resources
- Recreation, parks, and managed areas
- Socioeconomics and environmental justice

TVA's proposed action would satisfy the requirements of Executive Order (EO) 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), EO 12372 (Intergovernmental Review), EO 12898, 14008, and 14096 (Environmental Justice), EO 13112 (Invasive Species) and EO 13751 (Safeguarding the Nation From the Impacts of Invasive Species) that amends EO 13112, EO 13653 (Preparing the U. S. for the Impacts of Climate Change), and applicable laws including the Farmland Protection Policy Act, the National Historic Preservation Act, the Endangered Species Act (ESA), the Clean Air Act (CAA), and the Clean Water Act (CWA).

Potential effects related to prime farmland, transportation, air quality and global climate change, solid and hazardous waste, and health and safety were considered. Because of the nature of the action, any potential effects to these resources would be minor and insignificant. Thus, any further analysis for effects to these resources was not deemed necessary except as discussed in relation to other resource areas.

1.7. Necessary Permits or Licenses

Prior to construction, a permit would be required from Mississippi Department of Environmental Quality (MDEQ) for the discharge of construction site storm water associated with the construction of the transmission lines. TVA would prepare the required erosion and sedimentation control plans and coordinate them with the appropriate state and local authorities. A Section 401 Water Quality Certification would be obtained as required for physical alterations to waters of the State. A Section 404 Nationwide Permit would be obtained from the USACE if construction activities would result in the discharge of dredge or fill into waters of the United States (U.S.). A permit would be obtained from the Mississippi Department of Transportation (MDOT) for crossing state highways or federal interstates during transmission line construction.

CHAPTER 2 – ALTERNATIVES INCLUDING THE PROPOSED ACTION

As described in Chapter 1, TVA proposes to build two separate 161-kV transmission lines to improve the existing power supply in the Starkville and eastern Mississippi areas. A description of the proposed action is provided below in Section 2.1.2. Additional background information about construction, operation, and maintenance of the transmission lines is also provided in Section 2.2 and would be applicable regardless of the location of the proposed facilities.

This chapter has seven major sections:

1. A description of alternatives;
2. A description of the construction, operation, and maintenance of the proposed transmission lines;
3. An explanation of the transmission line siting process;
4. A comparison of the alternative transmission line routes;
5. A comparison of anticipated environmental effects by alternative;
6. Identification of mitigation measures; and
7. Identification of the preferred alternative.

2.1. Alternatives

Two alternatives (i.e., the No Action Alternative and the Action Alternative) are addressed in further detail in this EA. Under the No Action Alternative, TVA would not implement the proposed action. The Action Alternative involves the purchase of easements for ROW and the construction, operation, and maintenance of the proposed transmission lines.

2.1.1. The No Action Alternative – TVA Does Not Provide Additional Power Supplies to the Starkville and East Mississippi Service Area

Under the No Action Alternative, TVA would not construct the proposed transmission lines to improve the existing power supply in the Starkville and eastern Mississippi areas or to serve EMEPA's upgraded Scooba 161-kV Substation. As a result, the TVA power system in the east Mississippi service area would continue to operate under current conditions including voltage instability, limited operational flexibility, increased risk for substation and transmission overloading, loss of service, and occurrence of violations of NERC reliability criteria. Additionally, the Kemper Combustion Turbine Plant would continue to have limitations on generation due to constraints to avoid overloading the transmission lines. TVA's ability to provide a strong, reliable source of power for continued economic health and future residential and commercial growth in the area would be jeopardized.

Should the transmission lines be constructed by other sources than TVA to provide power in the area, the potential environmental effects of implementing the No Action Alternative would likely be comparable to those of the Action Alternative described in Chapter 3. However, some variability of impacts could occur as effects of the construction would be dependent upon various factors, such as the routes selected, and the construction methods used.

Considering TVA's obligation to provide reliable electric service, the No Action Alternative is not a reasonable alternative. However, the potential environmental effects of adopting the No Action Alternative were considered in the EA to provide a baseline for comparison with respect to the potential effects of implementing the proposed action.

2.1.2. Action Alternative – TVA Provides Additional Power Supplies to the Starkville and East Mississippi Service Area

Under the Action Alternative, TVA would build two transmission lines to serve TVA's Midway, S. Macon, and Dekalb 161-kV substations and EMEPA's upgraded Scooba 161-kV Substation. The proposed Midway-S. Macon 161-kV Transmission Line and the S. Macon-DeKalb 161-kV Transmission Line would result in 52.2 miles of new transmission lines on about 363 acres of existing ROW and 268 acres of new ROW (Figure 1-1 and 1-2). TVA would also install OPGW on the proposed transmission lines to facilitate communications with the TVA network.

The proposed 19.4-mile Midway-S. Macon 161-kV Transmission Line would begin at TVA's existing Midway 161-kV Substation in Winston County. The line would then run east approximately 13.5 miles on existing 100-foot-wide ROW owned by TVA that was acquired in the 1950's for the now retired Midway-Macon 46-kV Transmission Line. The line would continue east on new ROW for approximately 2.5 miles before turning south for the last approximately 3.4 miles. The line would terminate into TVA's existing S. Macon 161-kV Substation in Noxubee County. Overall, the proposed Midway-S. Macon 161-kV Transmission Line would utilize about 163 acres of existing 100-foot-wide ROW along the retired Midway-Macon 46-kV Transmission Line and 71 acres of new 100-foot-wide ROW. This line would be built using single-pole, steel structures. TVA proposes to begin construction of the Midway-S. Macon 161-kV Transmission Line in fall 2025 with an in-service date of fall 2026.

The proposed 32.8-mile S. Macon-DeKalb 161-kV Transmission Line would begin at TVA's existing S. Macon 161-kV Substation located in Noxubee County. Between this substation and 4-County Electric Power Association's (4-County EPA) Shuqualak 161-kV Substation, the proposed line would utilize about 5.5 miles of the existing S. Macon–DeKalb No. 1 161-kV Transmission Line ROW. This 75-foot-wide ROW totaling 50 acres would be expanded to 100-feet-wide, excluding areas that overlap with highway property along US Highway 45, requiring about 17 acres of new ROW easements. The existing transmission line would be retired and rebuilt on two-pole, double-circuit structures along with the new S. Macon–DeKalb No. 2 Transmission Line. The remaining 27.3 miles of the proposed S. Macon-DeKalb 161-kV Transmission Line would utilize single-pole structures utilizing 150 acres of existing ROW and acquiring 197 acres of new ROW easements. Continuing just south of the Shuqualak 161-kV Substation, the proposed route would leave the existing ROW and head southeast as a single-circuit line to parallel US Highway 45 for approximately 13.4 miles on new 100-foot-wide ROW before reaching EMEPA's planned Scooba, MS 161-kV Substation expansion in Kemper County. The proposed route would then continue and utilize 8.9 miles of EMEPA's existing 75-foot-wide ROW that would be conveyed to TVA. Most of this ROW parallels Highway 16 on the north side between Scooba and DeKalb and would be widened to 100-feet-wide. The proposed route would then leave Highway 16 and utilize 3.5 miles of EMEPA's existing 100-foot-wide ROW that would also be conveyed to TVA. The line would then utilize approximately 1.5 miles of new 100-foot-wide ROW before terminating into TVA's existing DeKalb 161-kV Substation in Kemper County. TVA proposes to begin construction of the S. Macon-DeKalb 161-kV Transmission Line in fall 2026 with an in-service date of late spring 2028.

Temporary access roads would be required for construction and maintenance of the proposed transmission lines.

To facilitate the operation of the proposed transmission lines, TVA would modify the TVA system map boards to include the names and numbers of the new transmission lines.

Additional information describing implementation of the proposed Action Alternative and how the most suitable transmission line routes were determined is provided below in Sections 2.2 through 2.4.

2.1.3. Alternatives Considered but Eliminated from Further Discussion

During the development of this proposal, other alternatives were considered. However, upon further study, TVA determined that these alternatives were not feasible for the reasons provided below.

Underground Utility Lines

A frequent objection to the construction of new transmission lines involves their adverse visual effects. Thus, a frequently suggested alternative is the installation of underground transmission lines.

Power lines can be buried. However, most buried transmission lines tend to be low-voltage distribution lines (lines that are 13-kV or less) rather than high-voltage transmission lines, which tend to be 69-kV and above. Although low-voltage distribution lines can be laid into trenches and buried without the need for special conduits, burying higher voltage transmission lines requires extensive excavation as these transmission lines must be encased in special conduits or tunnels. Additionally, measures to ensure proper cooling and to provide adequate access are required. Usually, a road along or within the ROW for buried transmission lines must be maintained for routine inspection and maintenance.

Although buried transmission lines are much less susceptible to catastrophic storm damage, especially wind damage, they tend to be very expensive to install and maintain. Depending on the type of cable system used, special equipment or ventilation systems may be required to provide adequate cooling for the underground conductors. Similarly, they must be protected from flooding, which could cause an outage. Repairs of buried transmission lines may require excavation, and the precise location of problem areas can be difficult to determine.

The potential adverse environmental effects of constructing and operating a buried high-voltage transmission line would likely be greater overall than those associated with a traditional aboveground transmission line. In addition, the expense of a buried high-voltage transmission line would be prohibitive. For these reasons, burying the proposed transmission line is not a feasible option and this alternative was eliminated from further consideration.

2.2. Construction, Operation, and Maintenance of the Proposed Transmission Lines

2.2.1. Transmission Line Construction

2.2.1.1. Right-of-Way Acquisition and Clearing

A ROW utilizes an easement that would be designated for a transmission line and associated assets. The easement would require maintenance to avoid the risk of fires and other accidents and to ensure reliable operation. The ROW provides a safety margin between the high-voltage conductors and surrounding structures and vegetation. The ROW for this project is described in Section 2.1.2.

TVA would acquire easements from landowners for the proposed new ROW. These easements would give TVA the right to clear the ROW and to construct, operate, and maintain the transmission line, as well as remove "danger trees" adjacent to the ROW. Danger trees include any trees located beyond the cleared ROW, but that are tall enough to pass within five feet of a conductor or strike a structure should it fall toward the transmission line. The fee simple ownership of the land within the ROW would remain with the landowner, and many activities and land uses could continue to occur on the property. However, the terms of the easement agreement prohibit certain activities, such as construction of buildings and any other activities within the ROW that could interfere with the operation or maintenance of the transmission line or create a hazardous situation.

Because of the need to maintain adequate clearance between tall vegetation and transmission line conductors, as well as to provide access for construction equipment, all trees and most shrubs would be removed from the entire width of the ROW. Equipment used during this ROW clearing would include chain saws, skidders, bulldozers, tractors, and/or low ground-pressure feller-bunchers[5]. Marketable timber would be salvaged where feasible; otherwise, woody debris and other vegetation would be piled and burned, chipped, or taken off site. In some instances, vegetation may be windrowed along the edge of the ROW to serve as sediment barriers.

Vegetation removal in streamside management zones (SMZs) and wetlands would be restricted to trees tall enough, or with the potential to soon grow tall enough, to interfere with conductors. Clearing in SMZs would be accomplished using handheld equipment or remote-handling equipment, such as a feller-buncher, to limit ground disturbance.

TVA utilizes standard practices for ROW clearing and construction activities (TVA 2024b). These guidance and specification documents (listed below) are provided on TVA's transmission system projects web page and are taken into account when considering the effects of the proposed Action Alternative. TVA transmission projects also utilize best management practices (BMPs) as identified in TVA (2022) to provide guidance for clearing and construction activities.

[5] A feller-buncher is a self-propelled machine with a cutting head that is capable of holding more than one stem at a time. Tracked feller-bunchers are capable of operating on wet and loose soils, have a lower ground-pressure than wheeled equipment, and are less prone to rutting and compaction.

1. *ROW Clearing Specifications*
2. *Environmental Quality Protection Specifications for Transmission Line Construction*
3. *Transmission Construction Guidelines Near Streams*
4. *Environmental Quality Protection Specifications for Transmission Substation or Communications Construction*
5. *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (hereafter referred to as "TVA 2022")

The emission of criteria pollutants or their precursors would not exceed *de minimis* levels specified in 40 CFR § 93.153(b). Thus, consistent with Section 176(c) of the CAA, project activities would be in conformity with the requirements of Mississippi's State Implementation Plan for attaining air quality standards.

Following clearing and construction, an appropriate vegetative cover on the ROW would be restored. TVA would utilize appropriate seed mixtures as described in TVA 2022 or work with property owners with impacted crop land to ensure restoration supports or minimizes impacts to production. Erosion controls would remain in place until the plant communities become fully established. Streamside areas would be revegetated as described in the above documents. Failure to maintain adequate clearance can result in dangerous situations, including ground faults. As such, native vegetation or plants with favorable growth patterns (slow growth and low mature heights) would be maintained within the ROW following construction. All future ROW maintenance would be performed in accordance with the 2019 vegetation management programmatic EIS (TVA 2019b) and associated injunction arising under *Sherwood v. TVA* (Appendix A).

2.2.1.2. Access Roads

Access roads would be needed to allow vehicular access to each structure and other points along the ROW. Typically, new permanent or temporary access roads used for transmission lines are located on the ROW wherever possible and are designed to avoid severe slope conditions and to minimize environmental resources such as stream crossings. Access roads are typically about 12 to 16 feet wide and are covered with dirt, mulch, or gravel.

Culverts and other drainage devices, fences, and gates would be installed as necessary. Culverts installed in any permanent streams would be removed following construction. However, in ephemeral[6] streams, also called wet-weather conveyances (WWC), 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. 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* (TVA 2024b).

[6] Ephemeral streams are also known as wet-weather conveyances or streams that run only following a rainfall.

2.2.1.3. Construction Assembly Areas

A construction assembly area (or "laydown" area) would be required for worker assembly, vehicle parking, and material storage. This area typically may be on existing substation property or may be leased from a private landowner for the duration of the construction period. TVA has identified two locations to support the proposed project (see Figures 2-1 and 2-1). The property is typically leased by TVA about a month before construction begins. Properties such as existing parking lots or areas used previously as car lots are ideal laydown areas because site preparation is minimal. Selection criteria used for locating potential laydown areas include areas that are typically five acres in size; relatively flat; well drained; previously cleared; preferably graveled and fenced; preferably with wide access points with appropriate culverts; sufficiently distant from streams, wetlands, or sensitive environmental features; and located adjacent to an existing paved road near the transmission line. TVA initially attempts to use or lease properties that require no site preparation. However, at times, the property may require some minor grading and installation of drainage structures such as culverts. Likewise, the area may require graveling and fencing. Trailers used for material storage and office space would be parked on the site. Following completion of construction activities, all trailers, unused materials, and construction debris would be removed from the site. Removal of TVA-installed fencing and site restoration would be performed by TVA at the discretion of the landowner.

Figure 2-1. Macon, Mississippi Brickyard Laydown Area

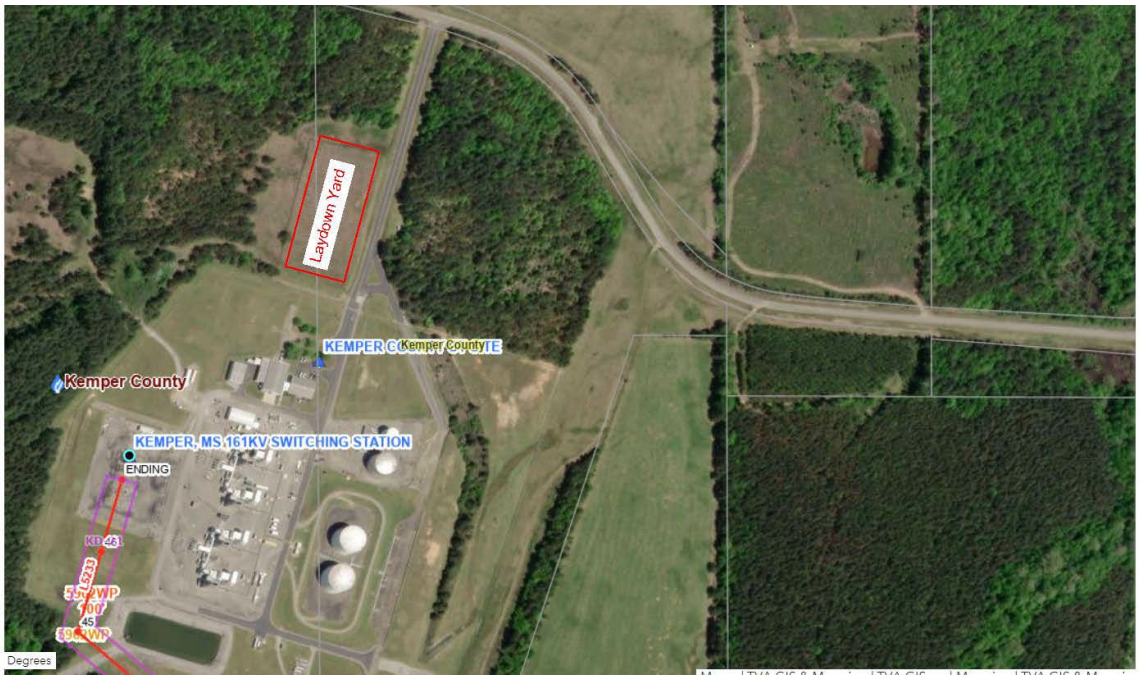

Figure 2-2. Kemper, Mississippi 161-kV Switching Station Laydown Area

2.2.1.4. Structures and Conductors

The proposed transmission lines would utilize single, double, and triple steel-pole structures; however, the majority would consist of single-pole structures. Examples of these structure types are shown in Figures 2-1 and 2-2. Structure heights would vary according to the terrain but would range between 61 to 106 feet above ground.

Three conductors (the cables that carry the electrical current) are required to make up a single circuit in alternating current transmission lines. For a 161-kV transmission line, each single-cable conductor is attached to porcelain insulators suspended from the structure cross arms. A smaller overhead ground wire or wires are attached to the top of the structures.

Poles at angles (angle points) in the transmission lines may require supporting screw, rock, or log-anchored guys. Some angle structures may be self-supporting poles or steel towers, which would require concrete foundations. Most poles would be directly imbedded in holes augured into the ground to a depth equal to 10 percent of the pole's length plus an additional two feet. Normally, the holes would be backfilled with the excavated material, but, in some cases, gravel or a concrete-and-gravel mixture would be used, depending on local soil conditions.

Figure 2-3. Typical Single and Double Steel-Pole Structures

Figure 2-4. Typical Triple Steel-Pole Structures

Equipment used during the construction phase would include trucks, truck-mounted augers and drills, excavators, as well as tracked cranes and bulldozers. Low ground-pressure-type equipment would be used in specified locations (such as areas with soft ground) to reduce the potential for environmental impacts.

2.2.1.5. Conductor and Ground Wire Installation

Reels of conductor and ground wire would be delivered to the construction assembly area(s), and temporary clearance poles would be installed at road crossings to reduce interference with traffic. A small rope would be pulled from structure to structure. The rope would be connected to the conductor and ground wire and used to pull them down the line through pulleys suspended from the insulators. A bulldozer and specialized tensioning equipment would be used to pull conductors and ground wires to the proper tension. Crews would then clamp the wires to the insulators and remove the pulleys.

2.2.2. Operation and Maintenance

2.2.2.1. Inspection

Periodic inspections of 161-kV transmission lines are performed by helicopter aerial surveillance or by drones after operation begins. Foot patrols or climbing inspections are performed to locate damaged conductors, insulators, or structures, and to discover any abnormal conditions that might hamper the normal operation of the line or adversely affect the surrounding area. During these inspections, the condition of vegetation within the ROW, as well as that immediately adjoining the ROW, is noted. These observations are then used to plan corrective maintenance and routine vegetation management.

2.2.2.2. Vegetation Management

Management of vegetation along the ROW would be necessary to ensure access to structures and to maintain an adequate distance between transmission line conductors and vegetation. Adequate ground clearance is important to account for construction, design, and survey tolerances (e.g., conductor sagging). TVA uses more conservative distances than NESC requirements. TVA uses a minimum ground clearance of 24 feet for a 161-kV transmission line and 30-feet for a 500-kV transmission line at the maximum line operating temperature. Vegetation management along the ROW would consist of two different activities: felling danger trees adjacent to the cleared ROW (as described in Section 2.2.1.1), and vegetation control within the cleared ROW total width. These activities occur on approximately 3-year cycles.

As referenced in Section 1.4, TVA completed the Transmission System Vegetation Management PEIS in 2019 which addresses tools and methods TVA will use to manage ROW vegetation. Subsequent site specific NEPA documents which tiered from the PEIS were also completed (TVA 2020; TVA 2021; TVA 2023; TVA 2024b) to ensure resource impacts would be avoided, minimized, or mitigated. Management of vegetation within the cleared ROW would include an integrated vegetation management approach designed to encourage the low-growing plant species and discourage tall-growing plant species. A vegetation re-clearing plan would be developed for each transmission line connection, based on the results of the periodic inspections described above. The two principal management techniques are mechanical mowing (using tractor-mounted rotary mowers) and herbicide application. Herbicides are normally applied in areas where heavy growth of woody vegetation is occurring on the ROW and mechanical mowing is not practical. Herbicides would be selectively applied from the ground with backpack sprayers or vehicle-mounted sprayers, or, in rare cases, by helicopter.

Any herbicides used are applied in accordance with applicable state and federal laws and regulations. Only herbicides registered with the U.S. Environmental Protection Agency (EPA) are used. A list of the herbicides currently used by TVA in ROW management is

presented in Appendix B. This list may change over time as new herbicides are developed or new information on presently approved herbicides becomes available.

2.2.2.3. Structure Replacement

Other than vegetation management, only minor maintenance work is generally required. The transmission line structure and other components typically last several decades. If a structure needs to be replaced, the structure would normally be lifted out of the ground by crane-like equipment, and the replacement structure would be inserted into the same hole or an adjacent hole. Access to the structures would be via existing roads. Replacement of structures may require leveling the area surrounding the replaced structures, but additional area disturbance would be minor compared to the initial installation of the structure.

2.3. Siting Process

The Siting methodology is a process of weighing all relevant factors to achieve a balanced solution. The process of Siting the proposed transmission lines followed the basic steps used by TVA to determine a transmission line route. These include the following steps:

- Determine the potential existing power sources to supply the transmission lines.
- Define the study area.
- Collect data to minimize potential impacts to social, engineering, and environmental (cultural and natural) features.
- Identify general route segments producing potential routes.
- Gather public input.
- Redefine general route segments.
- Incorporate public input into the final selection of the transmission line route.

2.3.1. Definition of the Study Area

The study area was determined primarily by the geographic boundaries of TVA's existing power system assets (Midway, Macon, S. Macon, and DeKalb 161-kV substations) in addition to existing ROW, land use, topography, and EMEPA's proposed upgraded Scooba 161-kV Substation site in Scooba.

The Midway-S. Macon Transmission Line study area is approximately 28.6 square miles and includes a small portion of the eastern end of Winston County and the rest of the study area lies in Noxubee County near the town of Macon. The S. Macon-DeKalb Transmission Line study area is approximately 99.2 square miles and lies in Noxubee and Kemper Counties and includes portions of the towns of Macon, Shuqualak, Scooba, and DeKalb.

For the first phase, the Midway-S. Macon Transmission Line, the northern boundary was defined by the existing ROW for the entire section from Midway to S. Macon to allow for consideration of any possible route options that could utilize the existing ROW to the greatest extent practical. For the second phase, the S. Macon-DeKalb Transmission Line, the northern boundary was defined to include the S. Macon 161-kV Substation, which was the beginning point of this transmission line. From there, the first approximately 4.5 miles on the northern end of the study area consists of a 2,000-foot-wide corridor that follows the existing 75-foot-wide ROW from S. Macon to Shuqualak along US Highway 45.

The western boundary was defined to include the Midway 161-kV Substation, which was the beginning point of the transmission line. From there, the first approximately 6.5 miles on the western end of the study area consists of a 1,000-foot-wide corridor that follows the existing 100-foot-wide ROW from Midway to S. Macon on the north side of State Highway 14. The eastern boundary was defined by US Highway 45 and the existing Weyerhaeuser-S. Macon 161-kV Transmission Line which both extend in the north direction from the S. Macon 161-kV Substation.

The southern boundary of the study area was extended southeast from the existing TVA ROW at the point where the existing ROW begins to turn northeast away from the direction of the S. Macon 161-kV Substation. This southern boundary continues in a southeast direction until it reaches the area of the S. Macon Substation which allowed additional route options to be considered. These route options would have potentially allowed for shorter overall route lengths but greater lengths of new ROW to be acquired versus utilization of the existing ROW. The proximity of the SeaRay Target Range to the south was a notable factor in not extending the study area farther to the south.

Beginning in Shuqualak, the study area expands to approximately 6 miles wide and extends approximately 14 miles to the southeast to the Scooba area. This section of the study area is centered along the US Highway 45 corridor that connects these two towns. Considering the S. Macon, Shuqualak, and Scooba substations are all located within near to US Highway 45, and the areas in between these substations along US Highway 45 are relatively open in terms of locating proposed transmission line routes, it was determined that aligning the study area with this highway corridor provided the most efficient and direct path for the proposed greenfield alternative routes that were reviewed for this project.

From Scooba to DeKalb, the study area roughly follows the existing EMEPA ROW that would be conveyed to TVA for this project and generally follows State Highway 16 corridor between the two towns. Most of this section of the study area is slightly over 1 mile in width and expands to almost 2 miles in width as it gets closer to DeKalb. This expansion of the study area near Dekalb is necessary since the EMEPA ROW deviates away from State Highway 16 just west of EMEPA's Townsend 46-kV Substation and eventually parallels TVA's DeKalb-Kemper 161-kV Transmission Line for approximately 3 miles before reaching the DeKalb area.

This study area did not include the SeaRay Target Range located in Noxubee County which was a major geographical constraint that required consideration ahead of setting the study area boundary for the Midway-S. Macon phase of the proposed project. This facility is owned by the United States Navy and is used for military aviation training, specifically air-to-ground delivery of practice (non-high-explosive) munitions. The Naval Air Station in Meridian provided detailed information of different flight paths, bombing patterns, and buffer zones associated with this target range. The Columbus Air Force Base Auxiliary Field Airport near Shuqualak was included in the study area and would present minimal glide path restrictions for the preferred route selected for this project.

2.3.2. Description of the Study Area

The study area has a mix of flat and gently rolling terrain, much of which is utilized for agriculture and residential areas. The proposed Midway-S. Macon portion of the project traverses a rural landscape, dominated by pastureland, forested uplands and bottomlands, pine plantations, and agricultural fields. The majority of the proposed S. Macon-Scooba-Dekalb portion of the project area is adjacent to highways. However, the proposed

transmission lines also cross rural landscapes that include pastureland, forested uplands and bottomlands, and pine plantations. The farmland is a mixture of commercial farming (corn, soybeans, and cotton) and cattle pasture. The residential homes are built up around the main road systems. The Noxubee River runs south-east through the northern portion of the study area.

2.3.3. Data Collection

TVA collected geographic data such as topography, land use, transportation, environmental features, and cultural resources for the study area. Information sources used in the transmission line study included design drawings for area transmission lines, data collected into a geographic information system (GIS), including U.S. Geological Survey (USGS) digital line graphs, National Wetland Inventory (NWI) maps, wetland modelling results, floodplains, photo-interpreted land use/land cover data, and Winston, Noxubee, and Kemper counties tax maps. Also used were various proprietary data maintained by TVA in a corporate geo-referenced database (i.e., TVA Regional Natural Heritage database file data on sensitive plants and animals and archaeological and historical resources).

Data was then analyzed both manually and with GIS. The use of GIS allows substantial flexibility in examining various types of spatially superimposed information. This system allowed the multitude of study area factors to be examined simultaneously for developing and evaluating numerous options and scenarios to select the transmission line route that would best meet project needs, which included avoiding or reducing potential environmental impacts.

Calculations from aerial photographs, tax maps, and other sources included, but were not limited to, the number of road crossings, stream crossings, and property parcels. The aerial photography, GIS-based map, and other maps and drawings were supplemented by reconnaissance, where possible by TVA.

2.3.4. Establishment and Application of Siting Criteria

TVA uses a set of evaluation criteria that represents opportunities and constraints for development of alternative transmission line routes. These criteria include social, engineering, and environmental factors such as existing land use, ownership patterns, environmental features, cultural resources, and visual quality. Cost is also an important factor, with engineering considerations, materials, and ROW acquisition costs being important elements. Identifying feasible transmission line routes involves weighing and balancing these criteria. TVA can, and does, deviate from the criteria, adjusting as specific conditions dictate.

Specific criteria used to evaluate transmission line route options are described below. For each feature identified as occurring along a proposed route option, specific considerations related to these features were identified and scored. A higher score means a larger constraint or obstacle for locating a transmission line. For example, a greater number of streams crossed, a longer transmission line route length, or a greater number of historic resources affected would produce a higher, less favorable score.

- **Engineering and Constructability Criteria** include considerations such as terrain (steeper slopes can present major challenges for design and construction), total length of the transmission line route, number of primary and secondary road crossings, accessibility, the presence of pipeline and transmission line crossings, known airports, and total line cost.

- **Social Criteria** include total acreage of new ROW, parallel to existing TVA or local power company (LPC) lines, number of affected property parcels, issues raised in public comments, visual aesthetics, planned commercial/industrial development, and proximity to schools, dwellings, commercial or industrial buildings, barns, and chicken houses.

- **Environmental Criteria** include number of forested acres within the proposed ROW, the number of open water crossings, the number of floodplain or floodway crossings, the presence of wetlands, rare species habitat, and sensitive stream crossings (i.e., those supporting endangered or threatened species), the number of perennial and intermittent stream crossings, and the presence of archaeological and historic sites, churches, and cemeteries.

A GIS database and constraint map was developed identifying areas such as wetlands, biological sensitive areas, houses, commercial buildings, schools, streams and rivers, floodplains, open water/ponds, historical and archaeological areas, highways, cemeteries, open land, parks, disturbed areas, forested areas, airports, property boundaries, and other known obstructions. The constraint map was developed by photo interpretation of aerial photography of the study area and researching existing information regarding important natural, historical, and archaeological resources in the study area.

The total of the number of occurrences for each of the individual criteria was calculated for each potential alternative route. Next, a normalized ranking of alternative routes was performed for each individual feature based on each route's value as it related to the other alternative routes. Weights reflecting the severity of potential effects were then developed for each individual criterion. These criterion-specific weights were multiplied by the individual alternative rankings to create a table of weighted rankings. The weighted rankings for each alternative were added to develop overall scores for each alternative route based on engineering, social, and environmental criteria, and overall total. For each of these categories, a ranking of each alternative route was calculated based on the relationship between the various route's scores.

These rankings made it possible to recognize which routes would have the least and the greatest impact on engineering, social, and environmental resources based on the data available at this stage in the Siting process. Finally, the scores from each category were combined into an overall score. The alternative route options were then ranked by their overall scores.

2.4. Development of General Route Segments and Potential Transmission Line Routes

As described in Section 2.3.3, the collected data were used to develop possible transmission line route segments that would best meet the project needs while avoiding or reducing conflict with constraints and by using identified opportunities. For reference, Segment locations are shown on Figures 1-3 and 1-4.

2.4.1. Potential Transmission Line Corridors

Using the two identified starting points of the Midway 161-kV and S. Macon 161-kV substations, the EMEPA's planned upgraded Scooba 161-kV Substation site, and the tools listed in the Siting Process in Section 2.3, preliminary route segments were identified that could be used to define alternative transmission line routes that would best meet project

needs while avoiding or reducing conflict with constraints and by using existing opportunities.

The tax maps provided property boundaries, which were used to locate a route with minimum impact to the number of properties as well as to individual properties. In addition, several site visits were made to further characterize any potential problem areas in the study area. These segments were used to analyze 91 alternative routes, seven for the Midway-S. Macon 161-kV Transmission Line and 84 for the S. Macon-DeKalb 161-kV Transmission Line (see Figures 1-3 and 1-4).

2.4.2. Midway-S. Macon Transmission Line

For the first phase of the project, 15 individual route segments and 7 alternative routes were considered for the Midway-S. Macon 161-kV Transmission Line (see Figure 1-3 and Table 2-1).

Table 2-1 Midway-South Macon 161-kV Transmission Line Alternative Routes

Route Number	Alternative Segments	Total Length (Miles)
1	1-3-8-9-14-15	17.0
2	1-2-6-11-13-15	19.3
3	1-2-5-4-8-9-14-15	18.8
4	1-2-5-7-9-14-15	18.2
5	1-2-6-10-13-15	18.1
6	1-2-6-11-12-14-15	19.4
7	1-2-6-10-12-14-15	18.2

Considering the location of the Midway 161-kV Substation on the western end of the study area and the existing TVA-owned 100-foot-wide ROW that extends from the Midway Substation to Macon, TVA determined that the utilization of existing ROW for the first approximately 7.2 miles was the best route option available to begin the route between Midway and S. Macon. Therefore, Segment 1 was incorporated into each of the 7 alternative route options.

From the end of Segment 1, Segments 2 and 3 were presented as routing options to provide alternative paths to S. Macon. Segment 2 would offer benefits in utilizing more existing ROW which would be efficient in minimizing ROW acquisition costs and impacts to new property owners, but Segment 3 presented opportunities for a more direct path to S. Macon and shorter overall line lengths. Segment 3 would utilize less of the existing ROW, however, would add to overall ROW acquisition costs.

Route 1 was the only route option that included Segment 3 which is located on the southern end of the study area. After Segment 3, this route would continue in the southeasterly direction and utilize Segments 8, 9, 14, and 15 before terminating in the S. Macon 161-kV Substation.

Routes 2 through 7 all included Segment 2 before deviating either south or east in their paths to reach the S. Macon Substation. Routes 2, 5, 6, and 7 would continue east after Segment 2 and include Segment 6 which would utilize slightly over 2 miles of additional existing ROW versus Routes 3 and 4 which deviated from the existing ROW after Segment 2.

Routes 2 and 6 would continue east past Segment 6 along new proposed ROW on Segment 11 for almost 2.5 miles before turning south and paralleling the east side of the railroad for approximately 2.4 miles. After Segment 11, Route 2 veers off to the southeast for approximately 0.5 miles along Segment 13 before turning east for approximately 0.4 miles along Segment 15 and then terminating into S. Macon Substation. Route 6 continues south after Segment 11 for almost 0.5 miles along Segment 12 and then turns east approximately 0.6 miles along Segments 14 and 15 before terminating into the S. Macon Substation.

Routes 5 and 7 divert to the southeast after Segment 6 and would utilize Segment 10 for approximately 1.75 miles before taking a slight turn and continuing in the southeasterly direction for almost 2 more miles. After Segment 10, Route 5 continues to the southeast for approximately 0.5 miles along Segment 13 before turning east for approximately 0.4 miles along Segment 15 and then terminating into S. Macon Substation. Route 7 turns south after Segment 10 for almost 0.5 miles along Segment 12 and then turns east approximately 0.6 miles along Segments 14 and 15 before terminating into the S. Macon Substation.

Route 3 turned in the south direction after Segment 2 and included Segments 5 and 4 before turning southeast to utilize Segments 8, 9, 14, and 15 to reach the S. Macon Substation. Route 4 also would turn in a southern direction after Segment 2 for slightly over 0.5 mile before heading southeast on Segment 7 and then to Segments 9, 14, and 15 before arriving at the S. Macon Substation.

2.4.3. S. Macon-DeKalb Transmission Line Alternative Routes

For the second phase of the project, a total of 84 routes consisting of 32 individual alternative segments were considered for the S. Macon-DeKalb 161-kV Transmission Line (see Figure 1-4 and Table 2-2). Originally, TVA considered 29 alternative segments numbered 1 through 29 which amounted to a total of 180 different route combinations. Before beginning the analysis, Segments 26 and 28 were eliminated outside of DeKalb due to outage constraints from TVA's perspective and interference with future development plans for EMEPA. These segments were primarily on either TVA or EMEPA property, with only a portion of Segment 26 being on private property already impacted by other nearby route segments. Eliminating these routes reduced the total number of route combinations to 60 routes.

However, during the analysis, TVA identified and added a new connector segment across US Highway 45 about 0.7 mile north of EMEPA's Scooba Substation. This allowed for an additional opportunity to cross back over to the west side of the highway before entering the Scooba Substation in addition to minimizing impacts to residential property in consideration of comments received from nearby property owners. The new connector segment was numbered as Segment 30, and the southern remainders of Segment 17 west of US Highway 45 and Segment 14 east of US Highway 45 were re-numbered Segments 31 and 32, respectively. This increased the final number of route combinations that were considered in the final analysis to a total of 84 alternative routes (see Figure 1-4).

Table 2-2. The Proposed South Macon-DeKalb 161-kV Transmission Line Alternative Route Options Considered and Corresponding Individual Alternative Segments

Route Number	Alternative Segments	Total Length (Miles)
1	1-2-4-5-10-11-14-32-18-19-24-25-27-29	32.8
2	1-2-4-5-10-12-13-16-17-31-18-19-24-25-27-29	32.7
3	1-2-4-5-10-12-15-17-31-18-19-24-25-27-29	32.8
4	1-2-4-5-7-9-14-32-18-19-24-25-27-29	32.8
5	1-2-4-5-8-16-17-31-18-19-24-25-27-29	32.9
6	1-2-4-6-9-14-32-18-19-24-25-27-29	32.7
7	1-2-4-6-7-10-11-14-32-18-19-24-25-27-29	32.8
8	1-2-4-6-7-10-12-13-16-17-31-18-19-24-25-27-29	32.7
9	1-2-4-6-7-10-12-15-17-31-18-19-24-25-27-29	32.8
10	1-2-4-6-7-8-16-17-31-18-19-24-25-27-29	32.9
11	1-3-4-5-10-11-14-32-18-19-24-25-27-29	32.5
12	1-3-4-5-10-12-13-16-17-31-18-19-24-25-27-29	32.4
13	1-3-4-5-10-12-15-17-31-18-19-24-25-27-29	32.5
14	1-3-4-5-7-9-14-32-18-19-24-25-27-29	32.5
15	1-3-4-5-8-16-17-31-18-19-24-25-27-29	32.6
16	1-3-4-6-9-14-32-18-19-24-25-27-29	32.4
17	1-3-4-6-7-10-11-14-32-18-19-24-25-27-29	32.5
18	1-3-4-6-7-10-12-13-16-17-31-18-19-24-25-27-29	32.4
19	1-3-4-6-7-10-12-15-17-31-18-19-24-25-27-29	32.5
20	1-3-4-6-7-8-16-17-31-18-19-24-25-27-29	32.6
21	1-2-4-5-10-11-14-32-18-20-21-24-25-27-29	32.9
22	1-2-4-5-10-12-13-16-17-31-18-20-21-24-25-27-29	32.8
23	1-2-4-5-10-12-15-17-31-18-20-21-24-25-27-29	32.9
24	1-2-4-5-7-9-14-32-18-20-21-24-25-27-29	32.9
25	1-2-4-5-8-16-17-31-18-20-21-24-25-27-29	33.0
26	1-2-4-6-9-14-32-18-20-21-24-25-27-29	32.8
27	1-2-4-6-7-10-11-14-32-18-20-21-24-25-27-29	33.0
28	1-2-4-6-7-10-12-13-16-17-31-18-20-21-24-25-27-29	32.9
29	1-2-4-6-7-10-12-15-17-31-18-20-21-24-25-27-29	32.9
30	1-2-4-6-7-8-16-17-31-18-20-21-24-25-27-29	33.0
31	1-3-4-5-10-11-14-32-18-20-21-24-25-27-29	32.6
32	1-3-4-5-10-12-13-16-17-31-18-20-21-24-25-27-29	32.5
33	1-3-4-5-10-12-15-17-31-18-20-21-24-25-27-29	32.6
34	1-3-4-5-7-9-14-32-18-20-21-24-25-27-29	32.6
35	1-3-4-5-8-16-17-31-18-20-21-24-25-27-29	32.7
36	1-3-4-6-9-14-32-18-20-21-24-25-27-29	32.5
37	1-3-4-6-7-10-11-14-32-18-20-21-24-25-27-29	32.7
38	1-3-4-6-7-10-12-13-16-17-31-18-20-21-24-25-27-29	32.6
39	1-3-4-6-7-10-12-15-17-31-18-20-21-24-25-27-29	32.7
40	1-3-4-6-7-8-16-17-31-18-20-21-24-25-27-29	32.7
41	1-2-4-5-10-11-14-32-18-20-22-23-25-27-29	33.1
42	1-2-4-5-10-12-13-16-17-31-18-20-22-23-25-27-29	32.9
43	1-2-4-5-10-12-15-17-31-18-20-22-23-25-27-29	33.0
44	1-2-4-5-7-9-14-32-18-20-22-23-25-27-29	33.1
45	1-2-4-5-8-16-17-31-18-20-22-23-25-27-29	33.1
46	1-2-4-6-9-14-32-18-20-22-23-25-27-29	32.9
47	1-2-4-6-7-10-11-14-32-18-20-22-23-25-27-29	33.1
48	1-2-4-6-7-10-12-13-16-17-31-18-20-22-23-25-27-29	33.0

Route Number	Alternative Segments	Total Length (Miles)
49	1-2-4-6-7-10-12-15-17-31-18-20-22-23-25-27-29	33.1
50	1-2-4-6-7-8-16-17-31-18-20-22-23-25-27-29	33.2
51	1-3-4-5-10-11-14-32-18-20-22-23-25-27-29	32.8
52	1-3-4-5-10-12-13-16-17-31-18-20-22-23-25-27-29	32.7
53	1-3-4-5-10-12-15-17-31-18-20-22-23-25-27-29	32.8
54	1-3-4-5-7-9-14-32-18-20-22-23-25-27-29	32.8
55	1-3-4-5-8-16-17-31-18-20-22-23-25-27-29	32.8
56	1-3-4-6-9-14-32-18-20-22-23-25-27-29	32.6
57	1-3-4-6-7-10-11-14-32-18-20-22-23-25-27-29	32.8
58	1-3-4-6-7-10-12-13-16-17-31-18-20-22-23-25-27-29	32.7
59	1-3-4-6-7-10-12-15-17-31-18-20-22-23-25-27-29	32.8
60	1-3-4-6-7-8-16-17-31-18-20-22-23-25-27-29	32.9
61	1-2-4-6-9-14-30-31-18-19-24-25-27-29	32.7
62	1-3-4-6-9-14-30-31-18-19-24-25-27-29	32.4
63	1-2-4-6-9-14-30-31-18-20-21-24-25-27-29	32.8
64	1-3-4-6-9-14-30-31-18-20-21-24-25-27-29	32.5
65	1-2-4-6-9-14-30-31-18-20-22-23-25-27-29	32.9
66	1-3-4-6-9-14-30-31-18-20-22-23-25-27-29	32.6
67	1-2-4-5-7-9-14-30-31-18-19-24-25-27-29	32.8
68	1-3-4-5-7-9-14-30-31-18-19-24-25-27-29	32.5
69	1-2-4-5-7-9-14-30-31-18-20-21-24-25-27-29	32.9
70	1-3-4-5-7-9-14-30-31-18-20-21-24-25-27-29	32.6
71	1-2-4-5-7-9-14-30-31-18-20-22-23-25-27-29	33.0
72	1-3-4-5-7-9-4-30-31-18-20-22-23-25-27-29	32.7
73	1-2-4-5-10-11-14-30-31-18-19-24-25-27-29	32.8
74	1-3-4-5-10-11-14-30-31-18-19-24-25-27-29	32.5
75	1-2-4-5-10-11-14-30-31-18-20-21-24-25-27-29	32.9
76	1-3-4-5-10-11-14-30-31-18-20-21-24-25-27-29	32.6
77	1-2-4-5-10-11-14-30-31-18-20-22-23-25-27-29	33.0
78	1-3-4-5-10-11-14-30-31-18-20-22-23-25-27-29	32.7
79	1-2-4-6-7-10-11-14-30-31-18-19-24-25-27-29	32.8
80	1-3-4-6-7-10-11-14-30-31-18-19-24-25-27-29	32.5
81	1-2-4-6-7-10-11-14-30-31-18-20-21-24-25-27-29	32.9
82	1-3-4-6-7-10-11-14-30-31-18-20-21-24-25-27-29	32.6
83	1-2-4-6-7-10-11-14-30-31-18-20-22-23-25-27-29	33.1
84	1-3-4-6-7-10-11-14-30-31-18-20-22-23-25-27-29	32.8

This proposed line would begin at TVA's existing S. Macon 161-kV Substation located on the east side of US Highway 45. From there, the proposed route would utilize approximately 5.5 miles of the existing ROW for the S. Macon-DeKalb No. 1 161-kV Transmission Line between the S. Macon Substation and 4-County EPA's Shuqualak 161-kV Substation. The existing S. Macon-DeKalb No. 1 161-kV Transmission Line would be retired in this section and rebuilt as a double circuit line with the new S. Macon-DeKalb No. 2 161-kV Transmission Line. The existing 75-foot-wide TVA ROW in this section would be expanded to 100-feet-wide excluding areas that overlap with the highway ROW along US Highway 45. This section between S. Macon and Shuqualak was labeled as Segment 1 and was incorporated into each of the 84 proposed alternative route options.

Beginning just south of 4-County EPA's Shuqualak Substation, the proposed route would leave the existing ROW and head southeast as a single circuit line to parallel US Highway 45. The section would run approximately 13.4 miles on a new 100-foot-wide ROW before reaching EMEPA's future Scooba 161-kV Substation.

The original proposed route alternatives provided an opportunity to either roughly parallel the west side or east sides of US Highway 45. Segment 2 would run approximately 4.4 miles on the west side. Segment 3 would cross over to the east side of US Highway 45 and then parallel the highway for approximately 4.1 miles. The proposed route would then continue in a southerly direction. A combination of Segments 4 and 5 offered an opportunity to locate the route approximately 3.9 miles on the west side of the highway. Alternatively, a combination of Segments 4 and 6, also approximately 3.9 miles, would allow for a route on the east side of the highway.

From here, Segment 7 would serve as a crossover segment over US Highway 45 to allow for the option to transition to or from the east or west sides of the highway, if necessary, after Segments 5 and 6. Segment 8 would parallel the east side of the railroad for approximately 3.7 miles; whereas Segments 9 and 10 would continuing to parallel the east or west sides, respectively, for the next approximately 2.6 miles.

Similar to Segment 7, Segment 11 would serve as a crossover segment over US Highway 45 to allow for the option to transition to or from the east or west sides of the highway after Segments 9 and 10. From here, Segments 12, 13, 15, 16, and 17 were all located west of the highway before entering EMEPA's upgraded Scooba 161-kV Substation while Segment 14 would allow for a path east of the highway before entering the Scooba Substation.

In consideration of comments TVA received during scoping from nearby property owners, TVA added a new connector segment across US Highway 45 about 0.7 miles north of EMEPA's Scooba Substation during route analysis. This segment would allow for an additional opportunity to cross back over to the west side of the highway before entering the Scooba Substation. This additional segment would minimize any potential impacts to residential property. This new connector segment is Segment 30, and the southern remainders of Segment 17 west of US Highway 45 and Segment 14 east of US Highway 45 were re-numbered Segments 31 and 32, respectively.

From Scooba, MS, the proposed route will utilize 8.9 miles of existing 75-foot-wide ROW that is currently owned by EMEPA but will be conveyed to TVA. Most of this ROW parallels Highway 16 on the north side between Scooba and DeKalb and will be widened to 100-feet-wide. The proposed route will then leave Highway 16 and will utilize existing 100-foot-wide ROW that parallels a portion of TVA's DeKalb-Kemper 161-kV TL, which is currently owned by EMEPA but will by conveyed to TVA for approximately 3.5 miles. This section of almost 12.5 miles is labeled as Segment 18 and is included in all route alternatives since this is existing ROW that provides the most efficient path between Scooba and DeKalb.

After Segment 18, Segment 19 offered an opportunity to cross over to the north side of TVA's DeKalb-Kemper 161-kV TL and would parallel this line for almost one mile. Segment 20 continued south of TVA's DeKalb-Kemper Transmission Line and utilized slightly more EMEPA ROW before diverting off of the existing EMEPA ROW near County Road 39. Segment 21 joined with TVA's DeKalb-Kemper line and paralleled it on the south side for almost a half mile. Segment 22 paralleled a portion of the 46-kV EMEPA line on the north side between the DeKalb Primary and DeKalb District stations.

Segments 26 and 28 were eliminated outside of DeKalb due to outage constraints from TVA's perspective and interference with future development plans for EMEPA. These segments were primarily on either TVA or EMEPA property, with only a portion of Segment 26 being on private property already impacted by other nearby route segments. By eliminating these segments, this confirmed TVA's plans to utilize Segment 25 which parallels TVA's DeKalb-Kemper line on the south side as the route approaches the DeKalb Station and then turns south on the east side of the station to allow for TVA to terminate the future route for the S. Macon-DeKalb No. 2 line into the western bay by entering from the south end of the station. This option would be best for TVA and for EMEPA in terms of minimizing outages to the DeKalb station and TVA source lines in addition to minimizing the amount of re-termination work of the TVA source lines that would have been required at DeKalb if the route entered on the north side.

After a thorough review and analysis comparing the 84 route options that were presented and reviewed, Route 67 was chosen as the preferred route for the S. Macon-DeKalb transmission line. This route consists of Segments 1, 2, 4, 5, 7, 9, 14, 30, 31, 18, 19, 24, 25, 27, and 29.

In the Engineering and Constructability Category, this route ranked in the top quartile of the 84 routes. This was due to the least number of transmission line crossings, least number of major road crossings, and the shortest length of route within a 250-foot buffer of the railroad. This was an important factor since the railroad was identified as a potential cultural resource due to its age and historical significance to the area. While the route length of 32.8 miles was ranked 45 out of the 84 routes, it was only 0.4 mile longer than the shortest route since the range for all the routes was 32.4 miles to 33.2 miles. This put the length of Route 67 near the average of all the routes considered.

In the Social Category, this route ranked in the top quartile of the 84 routes considered in terms of the least number of apartments, houses, mobile homes, communication towers, and commercial/industrial buildings with 300 feet of the preferred route. It also was in the top quartile in terms of the least number of impacted property parcels and least number of negative public comments. The main negative in terms of social impacts of this route is that it ranks near the bottom quartile in terms of minimizing impacts to timber plantation land.

In the Environmental Category, this route ranked in the top 30 percent of the 84 routes. This was because of the least amount of forestland acreage impacted, least amount of open water crossings, least amount of floodplain and floodway crossings, least amount of major stream crossings, and least amount of forested wetland acreage impacted.

Routes 67 and 73 were the top two routes in terms of scoring and overall ranking. Route 67 was the only route to finish in the top 20 percent in all three categories in the analysis and is the most balanced overall in terms of engineering, social, and environmental impacts.

According to the analysis, Route 67 would impact approximately 18.4 acres of forested wetland versus approximately 30 acres for Route 73. This was the primary reason that Route 73 scored lower in the environmental category. Conversely, according to the analysis, Route 67 would impact approximately 65.2 acres of timber plantation land versus approximately 50.6 acres for Route 73 which was the primary reason that Route 67 scored lower in terms of social. It was ultimately decided that minimizing the impacts to forested wetlands should be weighed heavier than impacts to timber plantation land which was

pivotal in making Route 67 the preferred route. In summary, Route 73 scored just below Route 67 in the engineering category and slightly better than Route 67 in the social category. However, the environmental category was significantly worse for Route 73 which ultimately assisted in making Route 67 the preferred route.

2.5. Identification of the Proposed Preferred Transmission Line Route

Some of the considerations used in identifying and assessing alternative transmission line route locations were existing transmission line assets for use of existing ROW, public comments, residential and commercial development, transmission line length, terrain, road/highway crossings, threatened and endangered species habitat, forest clearing, stream crossings, cultural resources, and number of parcel/property tracts.

Statistical analyses (described in Section 2.3.4) using the criteria were completed for the alternative routes on the Midway-S. Macon and the S. Macon-DeKalb transmission lines. The results of the analyses were used as a tool to help determine which routes had the fewest impacts with respect to engineering, environmental, and social constraints.

2.5.1. Midway-S. Macon Transmission Line

After a thorough review and analysis comparing the seven route options presented during the open house, Route 6 was chosen as the preferred route for the Midway-S. Macon 161-kV Transmission Line. This route consists of Segments 1, 2, 6, 11, 12, 14, and 15.

In the Engineering and Constructability Category, this route ranked in the middle (4 out of 7) of the seven routes considered. While this route was the longest overall, it did rank in the top 15 percent for the consideration of length of routes within a 250-foot buffer of Class 1, 2, 3, and 4 roads. This is considered a positive in terms of optimizing access to the route during construction. Additionally, this route was tied with Route 2 as having the least amount of route length within the airspace buffer for the SeaRay Target Range as directed by the Department of the Navy. Per input from the Naval Air Station in Meridian, Mississippi, Routes 2 and 6 maintained more separation from the target range than the other routes and helped to ensure that the military mission can continue unhindered.

In the Social Category, this route ranked the highest (1 out of 7) of the seven routes considered. While this route was the longest overall, it was tied with Routes 2, 5, and 7 for the most utilization of existing ROW at 13.5 miles. This route ranked in the middle (4 out of 7) in terms of amount of new ROW to be acquired at approximately 5.9 miles. Additionally, this route consisted of the greatest amount of total length that was within a 250-foot buffer of a railroad, which was considered as a positive in terms of paralleling existing infrastructure. This route also was favorable in the Social Category due to it being tied with Route 2 in having the least number of negative public comments and it also was approved by the Department of the Navy in terms of its proximity to the SeaRay Target Range and its associated airspace restrictions.

In the Environmental Category, this route ranked the lowest (7 out of 7) of the seven routes considered. This route ranked in the top half (3 out of 7) in terms of minimizing impacted acreage of forestland as classified by TVA's GIS team and in terms of acreage of open water crossings. This route was tied with Route 2 in having the largest amount of acreage within a floodplain impacted and total acreage of forested wetlands impacted which were significant factors in the low overall ranking in terms of environmental. This route, along with Route 2, was in the top half (2 out of 7) in terms of impacted acreage within non-forested wetlands.

Despite the lower environmental ranking described above, Route 6 scored the best overall in terms of Engineering and Constructability, Social, and Environmental considerations. Therefore, it was determined that this preferred route would have the least overall impact in terms of these three categories.

2.5.2. S. Macon-DeKalb Transmission Line

After a thorough review and analysis comparing the 84 route options that were presented and reviewed, Route 67 was chosen as the preferred route for the S. Macon-DeKalb transmission line. This route consists of Segments 1, 2, 4, 5, 7, 9, 14, 30, 31, 18, 19, 24, 25, 27, and 29.

In the Engineering and Constructability Category, this route ranked in the top quartile of the 84 routes. This was due to the least number of transmission line crossings, least number of major road crossings, and the shortest length of route within a 250-foot buffer of the railroad. This was an important factor since the railroad was identified as a potential cultural resource due to its age and historical significance to the area. While the route length of 32.8 miles was ranked 45 out of the 84 routes, it was only 0.4 mile longer than the shortest route since the range for all the routes was 32.4 miles to 33.2 miles. This put the length of Route 67 near the average of all the routes considered.

In the Social Category, this route ranked in the top quartile of the 84 routes considered in terms of the least number of apartments, houses, mobile homes, communication towers, and commercial/industrial buildings with 300 feet of the preferred route. It also was in the top quartile in terms of the least number of impacted property parcels and least number of negative public comments. The main negative in terms of social impacts of this route is that it ranks near the bottom quartile in terms of minimizing impacts to timber plantation land.

In the Environmental Category, this route ranked in the top 30 percent of the 84 routes considered in terms of the least amount of forestland acreage impacted, least amount of open water crossings, least amount of floodplain and floodway crossings, least amount of major stream crossings, and least amount of forested wetland acreage impacted.

Routes 67 and 73 were the top two routes in terms of scoring and overall ranking. Route 67 was the only route to finish in the top 20 percent in all three categories in the analysis and is the most balanced overall in terms of engineering, social, and environmental impacts.

According to the analysis, Route 67 would impact approximately 18.4 acres of forested wetland versus approximately 30 acres for Route 73. This was the primary reason that Route 73 scored lower in the environmental category. Conversely, according to the analysis, Route 67 would impact approximately 65.2 acres of timber plantation land versus approximately 50.6 acres for Route 73 which was the primary reason that Route 67 scored lower in terms of social. It was ultimately decided that minimizing the impacts to forested wetlands should be weighed heavier than impacts to timber plantation land which was pivotal in making Route 67 the preferred route. In summary, Route 73 scored just below Route 67 in the engineering category and slightly better than Route 67 in the social category. However, the environmental category was significantly worse for Route 73 which ultimately assisted in making Route 67 the preferred route (see Figure 1-1).

2.5.3. Explanation of Changes to the Proposed Preferred Transmission Line Route

A letter with a map showing the location of the preferred route on or near their property was mailed to owners. As noted above, coordination with property owners can result in changes in the preferred route. In addition, field and environmental survey activities can result in route adjustments to accommodate various issues and concerns raised during the overall field evaluation. A proposed route is not determined until completion of data gathering and field supplied input has been analyzed. The result of all the surveys, including for environmental, owner-provided information, and other field gathered input, is TVA's proposed preferred route.

The following changes were made to the original preferred route after contacting owners for survey permission and field surveys:

2.5.3.1. Midway-S. Macon Transmission Line

One angle location on Segment 11 was shifted approximately 35 feet to the east. This occurred in the section where the segment paralleled the railroad. This was done to provide adequate spacing for an existing gas line.

2.5.3.2. S. Macon-DeKalb 161-kV Transmission Line

In the initial 5.5 miles of existing single-circuit line from S. Macon to Shuqualak, the centerline was adjusted in the vicinity of the Highway 45 crossing. The adjustment changed the existing angled crossing of the highway to one that was perpendicular. A perpendicular crossing of the highway reduced the span length and was preferred when considering the engineering and construction of the line.

2.6. Comparison of Environmental Effects by Alternative

A summary of the anticipated potential effects of implementing the No Action and the Action Alternative is provided in Table 2-3.

Table 2-3. Summary and Comparison of Alternatives by Resource Area

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Groundwater and Geology	No effects to local groundwater quality or quantity are expected.	Impacts to groundwater quality or quantity are anticipated to be minor.
Surface Water	No changes in local surface water quality are anticipated.	Any impacts to surface waters in the project area are expected to be minor, temporary impacts with the proper implementation of standard BMPs (TVA 2022).
Aquatic Ecology	Aquatic life in local streams would not be affected.	With the implementation of SMZs and BMPs, impacts to aquatic animals resulting from the proposed project would not be significant.

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Vegetation	Local vegetation would not be affected.	Site preparation and clearing of approximately 313 acres of trees for the proposed transmission line ROWs would have a minor effect on most local vegetation. No uncommon plant communities are known from the vicinity of the project area and no rare plant communities were observed in the project area during the field survey. Implementation of the proposed project would not affect unique or important terrestrial habitat.
Wildlife	Local wildlife would not be affected.	Temporary direct impacts could occur to immobile wildlife and migratory birds of conservation concern during construction activities. Temporary minor indirect impacts are anticipated due to removing trees and other vegetation within the project area that would displace wildlife using these habitats. Because there are sufficient adjacent local habitats, any effects to populations of these species are expected to be insignificant.
Endangered and Threatened Species	No effects to endangered or threatened species or any designated critical habitats are anticipated.	Monarch butterfly eggs and larvae may be directly impacted during construction. Potential indirect effects to the federally listed northern long-eared bad and tri-color bat are possible due to removal of approximately 83.8 acres of suitable summer roosting habitat. However, with appropriate implementation of BMPs and procedures that are designed to avoid and minimize impacts to federally or state-listed species during site preparation, construction, and on-going maintenance activities, USFWS concurs that the proposed TVA action would not jeopardize the continued existence of northern long-eared bad, tricolored bat and monarch butterfly. The proposed action would not impact populations of state-listed black-knobbed map turtle.
Floodplains	No changes in local floodplain functions are expected.	With the implementation of standard BMPs and mitigation measures, no significant impact on floodplains would occur. All actions would be consistent with EO 11988.

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Wetlands	No changes in local wetland extent or function are expected.	The proposed project would permanently impact 70.49 acres of forested wetlands within the seven watersheds (Hashuqua Creek, Horse Hunters Creek-Noxubee River, Shuqualak Creek-Noxubee River, Running Water Creek-Macedonia Creek, Wahalak Creek, Bodka Creek, and Running Tiger Creek-Sucamoochie River) within the proposed project area. With appropriate permits, mitigation, and BMPs implemented, wetland impacts would be minor on a watershed scale.
Visual Resources	Aesthetic character of the area is expected to remain virtually unchanged.	Minor visual discord above ambient levels would be produced during construction and maintenance activities. The proposed transmission lines would present a minor, long-term visual effect.
Noise and Vibration	No noise or vibration impacts from construction or operation would occur because the proposed transmission lines would not be constructed.	Overall, temporary, minor noise above ambient levels would be produced during construction, operation, and maintenance activities.
Archaeological and Historic Resources	No adverse effects to archaeological or historic resources are anticipated.	TVA finds that the proposed undertaking would result in no adverse effects on historic properties.
Recreation, Parks, and Managed Areas	No changes in local recreation opportunities, managed areas, natural areas, or ecologically significant sites are expected.	No major impacts are anticipated to managed areas, natural areas, or ecologically significant sites from construction or operation of the proposed transmission lines.

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Socioeconomics and Environmental Justice	No change in local demographics, socioeconomic conditions, community services, or environmental justice populations.	Any adverse impacts to low income or minority communities in the project area would be similarly experienced by all people living along the proposed transmission line corridors. However, any adverse impacts would be minor due to the distance between residences and the proposed project area. These impacts are similar to impacts experienced by communities (Environmental Justice and non-Environmental Justice communities) living along TVA's transmission line network across the Valley. The proposed alternative would allow TVA to meet the foreseeable power demand for the area as well as providing EMEPA with additional operating flexibility and would ensure a continuous, reliable source of electric power in eastern Mississippi resulting in long-term indirect economic benefits to the area.

2.7. Identification of Mitigation Measures

TVA employs standard practices when constructing, operating, and maintaining substations, transmission lines, structures, and the associated ROW and access roads. These can be found on TVA's Transmission organization's website (TVA 2024b).

The following routine measures would be applied to reduce the potential for adverse environmental effects during the construction, operation, and maintenance of the proposed transmission lines and access roads are as follows:

- TVA would utilize standard BMPs, as described in Transmission's BMP guidance (TVA 2022), to minimize erosion during construction, operation, and maintenance activities.
- To minimize the introduction and spread of invasive species in the ROW, access roads and adjacent areas, TVA would follow standard operating procedures consistent with EO 13112 (Invasive Species) as amended by EO 13751 (Safeguarding the Nation From the Impacts of Invasive Species) for revegetating with noninvasive plant species as defined in TVA 2022.
- Wetlands would be protected by the implementation of standard BMP's as identified in TVA 2022.
- WWC/Ephemeral streams that could be affected by the proposed construction would be protected by implementing standard BMPs as identified in TVA 2022.
- Perennial and intermittent streams, both classified as "streams" in this document, would be protected by the implementation of standard stream protection (Category A) as defined in TVA 2022.

- Vegetation would be managed as outlined in TVA's Transmission System Vegetation Management PEIS (TVA 2019b) and according to TVA's *Transmission Environmental Protection Procedures Right-of-Way Vegetation Management Guidelines* (see Appendix B).

- During vegetation clearing activities, marketable timber would be salvaged where feasible; otherwise, woody debris and other vegetation would be piled, chipped, or taken off site. In some instances, vegetation may be windrowed along the edge of the project site to serve as sediment barriers. Implementation of *TVA ROW Clearing Specifications*, *Environmental Quality Protection Specifications for Transmission Line Construction*, *Transmission Construction Guidelines Near Streams*, and *Environmental Quality Protection Specifications for Transmission Substation or Communications Construction* (TVA 2024b), and in TVA 2022 would provide further guidance for clearing and construction activities.

- During construction of access roads, culverts and other drainage devices, fences, and gates would be installed, as necessary. Culverts installed in any perennial streams would be removed following construction. However, in ephemeral streams/WWCs, 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.

- Pesticide/herbicide use as part of construction or maintenance activities would comply with the TDEC General Permit for Application of Pesticides, which also requires a pesticide discharge management plan. In areas requiring chemical treatment, only EPA-registered and TVA approved herbicides would be used in accordance with label directions designed in part to restrict applications near receiving waters and to prevent unacceptable aquatic impacts (Appendix B).

- Integration of BMPs during construction and maintenance to minimize potential impacts to bat foraging habitat as described and in accordance with TVA's Programmatic Consultations on Bats and routine actions (TVA 2024c).

The following non-routine measures would be applied during construction of the proposed transmission lines and access roads to reduce the potential for adverse environmental effects.

- Because removal of suitable summer roosting bat habitat would likely occur when bats may be present on the landscape, a funding contribution (based on amount of habitat removed) towards future conservation and recovery efforts for federally listed bats would be carried out. Upon activity completion, funds will be contributed to TVA's Bat Conservation Fund.

- Construction would adhere to the TVA subclass review criteria for transmission line location in floodplains (TVA 1980).

- Any fill, gravel or other modifications in the Little Scooba Creek floodway that extend above the pre-construction road grade would be removed after completion of the project.

- Excess material would be spoiled outside of published floodways, and the area would be returned to its pre-construction condition.

- Any road improvements or construction would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot.

2.8. The Preferred Alternative

The Action Alternative—that TVA provides additional power sources to the Starkville area—including EMEPA's planned Scooba 161-kV Substation—is TVA's preferred alternative for this proposed project. TVA would acquire ROW easements and any associated access road easements and would build two separate 161-kV transmission lines, Midway-S. Macon 161-kV Transmission Line and the S. Macon-DeKalb 161-kV Transmission Line 161-kV Transmission Line. TVA would also install OPGW on the new transmission lines to facilitate communications with the TVA network.

TVA's preferred route alternatives for the Action Alternative are alternative route Option 6 for the Midway-S. Macon 161-kV Transmission Line, consisting of Segments 1, 2, 6, 11, 12, 14, and 15; and alternative route Option 67 for the S. Macon-DeKalb 161-kV Transmission Line, consisting of Segments 1, 2, 4, 5, 7, 9, 14, 30, 31, 18, 19, 24, 25, 27, and 29. The total combined length of the two transmission lines and ROW would be approximately 52.2 miles on about 363 acres of existing ROW and 268 acres of new ROW (see Figures 1-1 and 1-2).

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CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The existing condition of environmental resources that could be affected by the proposed Action Alternative during construction, operation, or maintenance of the approximately 52.2 miles of two transmission lines is described in this chapter. The descriptions below of the potentially affected environment are based on field surveys conducted in December 2022, January to March 2023, August to October 2023, and April to June 2024, on published and unpublished reports, and on personal communications with resource experts. This information establishes the baseline conditions against which TVA decision makers and the public can compare the potential effects of implementing the alternatives under consideration.

The analysis of potential effects to endangered and threatened species and their habitats included records of occurrence within a 3-mile radius for terrestrial animals, a 5-mile radius for plants, and a 10-mile radius for aquatic animals. The analysis of potential effects to aquatic resources included the local watershed but was focused on watercourses within or immediately adjacent to the proposed ROW and associated access roads. The area of potential effect (APE) for architectural resources included all areas within a 0.5-mile radius from the proposed transmission line route, as well as any areas where the project would alter existing topography or vegetation in view of a historic resource. The APE with respect to archaeological resources included the entire ROW width as described in Section 2.2.1.1 for the proposed route and the associated access roads.

Potential effects related to prime farmland, transportation, air quality, global climate change, solid waste, hazardous and nonhazardous wastes, and health and safety were considered. Potential effects on these resources were found to be minimal or absent because of the nature of the action.

3.1. Groundwater and Geology

3.1.1. Affected Environment

The Project Area is in the Southeastern Plains level III ecoregion and encompasses level IV ecoregions including Blackland Prairie, Flatwoods/Blackland Prairie Margins, and the Southern Hilly Gulf Coastal Plains (Chapman et al. 2004). The Southeastern Plains contain Cretaceous or Tertiary-age sand, silts, and clays. Streams in the area are low-to-moderate gradient and contain mostly sandy substrates. The Blackland Prairie level IV ecoregion is defined by distinctive Cretaceous-age chalk, marl, and calcareous clays of the Selma Group. The fine-textured, clayey soils tend to shrink and crack when dry, and they swell when wet. Streams are low gradient with chalk, clay, sand, and silt substrates, and have a high variability in flow. The Flatwoods/Blackland Prairie Margins region is a transitional region between the Blackland Prairie and the Flatwoods. The Flatwoods are comprised of mostly forested lowland areas of little relief, formed primarily on Late Cretaceous and Paleocene-age dark, massive, marine clay. Soils are very deep, clayey, poorly drained, and acidic. The Blackland Prairie Margins are undulating, irregular plains, with slightly more relief than the Flatwoods, but also tend to have clayey soils that are sticky when wet, hard and cracked when dry, and have generally poor drainage. The Southern Hilly Gulf Coastal Plains developed over diverse bands of Eocene, Oligocene, and Miocene sand, clay, and marl formations. This region has more rolling topography, higher elevations, and more

relief than the Blackland Prairie and Flatwoods/Blackland Prairie Margins. It contains areas of elevation that are characterized by gentle south slopes and steeper north-facing slopes (Chapman et al. 2004).

3.1.1.1. Aquifers and Groundwater Quality

The predominant aquifer that lies beneath the Project Area is the Lower Wilcox Aquifer, which is connected to the Mississippi Embayment Aquifer system (United States Geological Survey [USGS] 1988). The Mississippi Embayment is primarily fed by terrestrial recharge from streams and rivers during periods of high-water levels. The groundwater in this area primarily discharges to pumping wells, and the majority of these wells use the water for irrigation of farmland. The large amount of pumping relative to recharge has resulted in a loss of groundwater from storage and a chronic decline in water levels in many parts of the Mississippi Alluvial Plain since the 1940s (USGS 2023).

In 2014, a state Executive Order created the Governor's Delta Sustainable Water Resources Task Force to address declines in water levels (MDEQ 2024a). The Task Force and its work groups are focused on the development and implementation of approaches, strategies, and conservation measures to ensure sustainable ground and surface water resources for current and future generations in the Mississippi Delta Region.

The Lower Wilcox Aquifer is the bottommost layer of the Mississippi Embayment aquifer system (USGS 2021). The sedimentary deposits of the Mississippi Embayment system include layers of gravel, sand, silt, clay, and various blends of these soil types. The Mississippi Embayment is characterized by a compression of rocks to form a V-shape that plunges to the south and runs parallel to the Mississippi River. The maximum thickness is found in the southern part of the region and reaches to about 18,000 feet in some areas (USGS 1998). Water travels from the upper most levels of the aquifer system into the Middle Claiborne Aquifer. The Middle Claiborne Aquifer is mostly comprised of Sparta Sand and ranges in thickness from 200 to 1,000 feet. However, much of the Middle Claiborne Aquifer contains water with more than 1,000 milligrams per liter dissolved solids, which is unsuitable for most purposes (USGS 1998). This water then travels to the deepest layer of the aquifer system, known as the Lower Wilcox Aquifer. The Lower Wilcox Aquifer is characterized by sand and underlain by a thick layer of clay. The sand layer is comprised of fluvial sand, similar to present day Mississippi floodplains (USGS 2008). This aquifer is recharged mainly due to precipitation and downward leakage from aquifers found in the above ground layers. Throughout the Lower Wilcox Aquifer, dissolved-solids concentrations have a median value of 165 milligrams per liter (MDEQ 2021). Total dissolved solids with concentrations at 300 milligrams per liter and below are considered to have an excellent water rating which makes it suitable for public water use (Safe Drinking Water Foundation 2024).

3.1.1.2. Public Water Supply

The Safe Drinking Water Act of 1974 established the sole source aquifer protection program that regulates certain activities in areas where the aquifer (water-bearing geologic formations) provides at least half of the drinking water consumed in the overlying area. No sole source aquifers exist in Mississippi (EPA 2023). However, the Mississippi State Department of Health's Bureau of Public Water Supply ensures safe drinking water to 2.8 million citizens of Mississippi by enforcing requirements of the Federal and State Safe Drinking Water Acts (SDWAs) (MSDH 2024).

Table 3-1 lists the public water suppliers in Kemper, Noxubee, and Winston counties in the vicinity of the project area (Mississippi Public Service Commission 2024a; 2024b; and 2024c).

Table 3-1. Public Water Suppliers in the Vicinity of the Project Area, by County

County	Public Water Supplier
Kemper	Central Water Association Collinsville Water Association Inc. Duffee Water Association Inc. Kipling Water Association Inc. Northwest Kemper Water Association Porterville Water Association Townsend Community Water Association Inc.
Noxubee	City of Brooksville City of Macon Kipling Water Association Inc. Mashulaville Water District Inc. Northwest Kemper Water Association Great River Utility Operating Company LLC Piney Woods Water Association Porterville Water Association Shuqualak-Butler Water Association Town of Shuqualak, Mississippi Yellow Creek Water Association
Winston	Bond Water Association Calvary Rural Water Association City of Louisville Ellison Ridge Water Association High Point Water Association Liberty-Plattsburg Water Association Morgan Chapel Water Association Naniah Waiya Water Association Inc. Northwest Kemper Water Association Panhandle Water Association Inc. Pugh's Mill Water Association Inc. Southeast Noxapater Water Association. Inc. Town of Noxapater Yellow Creek Water Association Zama Water Association Inc.

Source: Mississippi Public Utilities Staff, Kemper, Noxubee, Winston counties, Mississippi Public Service Commission 2024a, 2024b, 2024c.

The drinking water from these water utility systems is sourced primarily from the Lower Wilcox Aquifer (Mississippi State Department of Health [MSDH] 2024a). Additionally, it is estimated that 13 percent of Mississippians do not have public water service and must rely on private wells (Rozier 2021). In Noxubee and Winston counties, 12 and 4.2 percent of the population, respectively, relies on private wells to obtain water (Mississippi State University 2019). The State of Mississippi has developed a Wellhead Protection Program to identify and properly manage potential contaminant sources in Wellhead Protection Areas from which public water system wells capture their water over a specific period of time (MDEQ 2021).

3.1.2. Environmental Consequences

3.1.2.1. Alternative A – No Action

Under the No Action Alternative, areas within the proposed or expanded ROWs and access roads would remain in their current condition. Therefore, no impacts to groundwater or geologic resources would occur from TVA actions associated with the proposed project.

3.1.2.2. Alternative B – Action Alternative

Under the Action Alternative, construction activities would entail localized ground disturbance and shallow excavation. Depth of excavation would be approximately 10 percent of the pole structure height plus an additional two feet. Because proposed structures would not exceed 120 feet in height, maximum excavation depth would be approximately 14 feet below ground surface. These construction activities would be limited to the transmission line ROW.

If groundwater is encountered during any construction activities, dewatering processes would be used to control groundwater infiltration into the excavation site and all state and federal requirements relating to groundwater protection would be followed. BMPs as described in *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority (TVA) Construction and Maintenance Activities* (TVA 2022) would be used to control the transportation and infiltration of pollutants that have the potential to impact groundwater. The proposed construction activities and below ground excavation would be localized and limited to the construction phase of the proposed project; therefore, any impacts to groundwater would be minor.

Potential water quality impacts to shallow groundwater can also occur at the construction site due to releases of contaminants such as petroleum fuels, lubricants, and hydraulic fluids associated with the operation and maintenance of construction equipment. However, the use of appropriate BMPs would prevent and minimize the potential for such releases. These BMPs include the proper maintenance of vehicles, restriction of maintenance and fueling activities to appropriate offsite areas, measures to avoid spills, and immediate management of incidental and accidental releases in accordance with standard practice and regulatory requirements.

No groundwater use would be required for construction or operation of the transmission lines; therefore, there would be no impact to groundwater levels or availability.

3.2. Surface Water

3.2.1. Affected Environment

The Federal Water Pollution Control Act, commonly known as the CWA is the primary law that affects water quality. It establishes standards for the quality of surface waters and prohibits the discharge of pollutants from point sources unless a National Pollutant Discharge Elimination System (NPDES) permit is obtained. Several other environmental laws contain provisions aimed at protecting surface water, including the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and the Federal Insecticide, Fungicide, and Rodenticide Act.

The proposed project area consists of two sections: the Midway-S. Macon section, located in Noxubee and Winston counties, and the S. Macon-Scooba-Dekalb section, which is located in Kemper and Noxubee counties. The Midway-S. Macon section falls within the following 10-digit hydrologic unit code (HUC) watersheds: Hashuqua (0316010804), Horse Hunter's Creek-Noxubee River (0316010805), Shuqualak Creek-Noxubee River (0316010807), and Running Water Creek-Macedonia Creek (0316010806). The S. Macon-Scooba-Dekalb section falls within the following 10-digit HUC watersheds: Running Water Creek-Macedonia Creek (0316010806), Shuqualak Creek-Noxubee River (0316010807), Wahalak Creek (0316010808), Bodka Creek (0316010810), and Running Tiger Creek-Sucarnoochee River (0316020201). All of these watersheds fall within the Noxubee watershed HUC-03160108.

Field surveys along the Midway-S. Macon section were conducted in December 2022, and January and February of 2023. Field surveys along the S. Macon-Scooba-Dekalb section were conducted in August 2023 and June 2024. A total of 44 watercourses including 14 perennial streams, nine intermittent streams, 16 WWC/ephemeral streams, and four ponds were observed during the field surveys. A listing of these stream and pond crossings (excluding WWC/ephemeral streams) is provided in Appendix C.

Precipitation in Mississippi ranges from 50 to 60 inches across the state (Mississippi State University [MSU] 2024). Rainfall is evenly distributed throughout the year, but the area is still subject to drought and flood. Stream flow varies with rainfall and available data indicates that runoff from the Noxubee River watershed is 1.4 cubic feet per second, per square mile of drainage area. Runoff measurements were obtained from 1927-2024 data for the Noxubee River at Macon (United States Geological Survey [USGS] 2024).

MDEQ designates uses specified in water quality standards for each water body within the state. These designations rely on the use and value of water for public water supplies, protection and propagation of aquatic life, recreation in and on the water, and protection of consumers of fish and shellfish. All streams and rivers near the project area are classified by MDEQ as Fish and Wildlife, which is a classification intended for fishing and should support protection and propagation of fish, aquatic life, and wildlife (MDEQ 2024b).

The CWA, under Section 303(d), requires States to identify all waters in which required pollution controls are not sufficient to attain or maintain applicable water quality standards and to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. In addition, the State assigns a priority for development of Total Maximum Daily Loads (TMDL) based on the severity of the pollution and the sensitivity of the uses, among other factors (EPA 2023). States are

required to submit reports to the EPA every two years to help better understand what mitigation efforts should be made for water bodies that are at risk. The term “303(d) list” refers to the list of impaired and threatened streams and water bodies identified by the state. No streams within the project area are listed on the current 303(d) list (MDEQ 2024c).

TVA establishes SMZs defined as areas or zones, covered with vegetation on both sides of perennial and intermittent streams and along the margins of bodies of open water, where extra precaution is used in carrying out construction activities to protect stream banks, instream aquatic habitat, and water quality. These zones also function as buffers when herbicides, fertilizers, etc., are applied to adjacent lands (TVA 2022).

3.2.2. Environmental Consequences

3.2.2.1. Alternative A - No Action

Under the No Action Alternative, areas within the proposed ROWs, expanded ROWs and access roads would remain in their current condition. Therefore, no impacts to surface water systems would occur as a result of TVA actions associated with the proposed project.

3.2.2.2. Alternative B - Action Alternative

3.2.2.2.1. Surface Runoff

Construction activities associated with the proposed transmission lines would involve ground disturbance for the installation of transmission line structures, resulting in the potential for increased erosion and sediment release, which may temporarily affect local surface waters via stormwater runoff. Soil erosion and sedimentation can contaminate and block small streams and threaten aquatic life. Appropriate BMPs would be followed to ensure the proposed action would minimize erosion and sedimentation impacts and possible introduction of pollutants into surface waters (TVA 2022). A general construction storm water permit would be needed if more than 1 acre is disturbed. This permit also requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would identify specific BMPs to address construction-related activities that would be adopted to minimize storm water impacts. Additionally, applicable USACE Section 404 Permits would be obtained for any stream crossing or alterations to jurisdictional wetlands, stream channels, or other waters of the U.S. (WOTUS) within the project area. Section 401 Water Quality Certification would be obtained from the state, as necessary, for stream alterations or crossings located within the project area.

TVA expects to utilize existing access roads to the extent possible and, as such, potential impacts to streams would be minimized through avoidance (if practical). The implementation of erosion and sediment BMPs identified in the SWPPP would be used to reduce potential sediment-laden runoff into adjacent or downgradient streams. However, temporary stream crossings may be required. Temporary stream crossings and other construction activities would comply with appropriate state and federal permit requirements and TVA BMPs (TVA 2022). Additionally, BMPs as described in *the Mississippi Erosion and Sediment Control Handbook* (MDEQ 2011) would be used to avoid contamination of surface waters in the project area. Proper implementation of these controls would be expected to result in only minor, temporary impacts to surface waters. See Section 3.3 Aquatic Ecology and Appendix C for buffer zone (i.e., SMZ) sizes and additional stream crossing details.

Changes in the perviousness of ground cover may alter the percolation rates of rain through the soil resulting in additional runoff of water and pollutants into storm drains, ditches, and streams. Clearing of vegetation and ground cover and the addition of gravel yards under this alternative would alter the current stormwater flows on the site(s). Any temporary increases in flow would be mitigated through the implementation of stormwater BMPs prior to discharge into the outfall(s) or offsite.

3.2.2.2.2. Domestic Sewage

During the construction phase, portable toilets would be provided for the construction workforce as needed. These toilets would be provided by a licensed vendor, would be pumped out regularly, and the sewage would be transported by tanker truck to a publicly owned wastewater treatment works that accepts domestic sewage.

3.2.2.2.3. Equipment Washing and Dust Control

Equipment washing and dust control discharges would be handled in accordance with BMPs described in the SWPPP for water-only cleaning and in the *Mississippi Erosion and Sediment Control Manual* (MDEQ 2011). TVA routinely includes precautions in the design, construction, and maintenance of its transmission line projects to minimize these potential impacts. TVA BMPs include washing equipment in specified areas where water runoff is mitigated to minimize pollution entering surface waters (TVA 2022). Proper implementation of these controls is expected to result in only minor temporary impacts to surface waters.

3.2.2.2.4. Stream Crossings

Permanent stream crossings that cannot be avoided are designed to not impede runoff patterns and the natural movement of aquatic fauna. Temporary stream crossings and other construction and maintenance activities would comply with appropriate state permit requirements and TVA BMPs (TVA 2022).

3.2.2.2.5. Transmission Line Maintenance

Improper use of herbicides to maintain and control vegetation within transmission line ROW has the potential to result in runoff to streams and impact resident aquatic biota. Therefore, any pesticide/herbicide use as part of construction or maintenance activities would comply with the Mississippi Pesticide Law (Miss. Code §69-23-1). This requires that a license be obtained for each location or outlet located within the state from which Restricted Use Pesticides are distributed, sold, or offered for sale (State of Mississippi 1975). In areas requiring chemical treatment, only EPA-registered and TVA approved herbicides would be used in accordance with label directions designed, in part, to restrict applications near receiving waters and to prevent unacceptable aquatic impacts. Proper implementation and application of these products would have no significant impacts to surface waters.

ROW maintenance would employ manual and low-impact methods wherever possible. Maintenance of vegetation within transmission line ROW will be consistent with TVA's Transmission System Vegetation Management Final PEIS (TVA 2019b) and TVA's BMP manual *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA 2022). TVA would use BMPs specifically directed toward avoiding or minimizing adverse impacts on SMZs and the waterbodies to minimize erosion and transport of sediments in the streams along the transmission line ROW. TVA guidance for environmental protection and BMPs limit the broadcast application of fertilizers and herbicides within the SMZs, including the spraying of herbicides other than those labeled for aquatic use (TVA 2022).

3.2.2.2.6. Summary

Construction and maintenance of the proposed transmission line ROW would increase septic output, solid wastes, the potential for sediment, herbicides, and other pollutants to enter waterways. Appropriate BMPs would be followed to minimize impacts associated with soil disturbance and all proposed project activities. Additionally, all construction and operation activities would be conducted in a manner to ensure that waste materials are contained and managed appropriately (e.g., refueling, maintenance activities, and storage of equipment) to ensure that the introduction of pollutants to the receiving waters would be minimized (TVA 2022).

Proposed project activities that result in unavoidable direct impacts to surface water resources would be mitigated as appropriate in conjunction with agency consultation. Additionally, BMPs would be used to further reduce direct and indirect impacts to surface water. Design, construction, and maintenance of the Midway-S. Macon-Dekalb 161-kV Transmission Line would abide by all federal, state, and local guidelines and all applicable permits; therefore, impacts to surface waters would be minor.

3.3. Aquatic Ecology

3.3.1. Affected Environment

The analysis of potential effects to aquatic resources included the local watersheds but was focused on the location of the proposed project (herein referred to as the proposed project area) which included the watercourses within or immediately adjacent to the proposed Midway-S. Macon section, which is located in Winston and Noxubee counties, and S. Macon-Scooba-Dekalb section, which is located in Noxubee and Kemper counties, and the associated transmission line ROWs and access roads. Refer to the details of the HUC watersheds that have already been described in Section 3.2 Surface Water.

Field surveys along the Midway-S. Macon section were conducted in December 2022, January through February of 2023, and May 2024. Field surveys along the S. Macon-Scooba-Dekalb section were conducted in August 2023, and April through May of 2024. Field surveys identified 136 watercourses including 35 perennial streams, 28 intermittent streams, 57 WWC/ephemeral streams, and 16 ponds.

A listing of perennial and intermittent stream and pond crossings within the two proposed ROWs and associated access roads, excluding WWC/ephemeral streams, is provided in Appendix C. Additional information regarding watercourses located in the vicinity of the project area can be found in Section 3.2 Surface Water.

Streams encountered during the field survey ranged from first order headwater streams to larger tributaries to named streams, including the following: Wolf Creek, Hashuqua Creek, Windhams Creek, Shuqualak Creek, Sid Creek, Wahalak Creek, Little Scooba Creek, Flat Scooba Creek, Big Scooba Creek, Hamilton Branch, Pole Branch, and Sucarnoochie River. These streams were observed in primarily forested cover with some agricultural and urban influences. Substrates were primarily gravel, sand, silt, and clay. Appropriate application of SMZs and BMPs minimizes the potential for water quality and instream habitat degradation which limits impacts to aquatic organisms.

Three classes were used to indicate the current condition of streamside vegetation within the proposed substation site, as defined below, and accounted for in Table 3-2.

- Forested - Riparian area is mostly vegetated with trees, shrubs, and herbaceous plants. Vegetative disruption from mowing or grazing is minimal or not evident. Riparian width extends more than 60 feet on either side of the stream.

- Partially forested - Although not forested, sparse trees and/or scrub-shrub vegetation is present within a wider band of riparian vegetation (20 to 60 feet). Disturbance of the riparian zone is apparent.

- Non-forested - No trees or only a few trees are present within the riparian zone. Significant clearing has occurred, usually associated with pasture or cropland.

Table 3-2. Riparian Condition of Streams Crossed by the Proposed Transmission Line Rights-of-Way and Associated Access Roads

Riparian Condition	Streams Within ROW [1]
Forested	46
Partially forested	26
Non-forested	48
Total	**120**

TVA assigns appropriate SMZs and BMPs based on field observations and other considerations (i.e., State 303(d) listing and presence of endangered or threatened aquatic species). Appropriate application of the SMZs and BMPs would minimize the potential for impacts to water quality and in-stream habitat for aquatic organisms. These guidelines outline site preparation standards with emphasis on soil stabilization practices, structural and sediment controls including runoff management, and general stream protection practices associated with construction activities. TVA would be obliged to adhere to state and federal permit requirements and to commit to any mitigation provisions as a result of adverse modifications made to the project area.

3.3.2. Environmental Consequences

3.3.2.1. Alternative A – No Action

Under the No Action Alternative, areas within the proposed ROWs, expanded ROWs and access roads would remain in their current condition. No impacts would occur to aquatic ecology as a result of TVA actions. However, changes to aquatic ecology are anticipated to continue to occur from the cumulative effects of surrounding land use practices and development due to population growth.

3.3.2.2. Alternative B – Action Alternative

Aquatic life could be affected by the proposed Action Alternative. The proposed project includes the construction of new transmission lines and structures within ROW easements. As such, it is foreseeable that the proposed ROW grading and clearing as well as future vegetation management processes could result in associated stream impacts.

Impacts could occur either directly by the alteration of habitat conditions within the stream or indirectly due to modification of the riparian zone and storm water runoff resulting from construction and maintenance activities associated with the vegetation removal efforts.

Potential impacts due to removal of streamside vegetation within the riparian zone include increased erosion and siltation, loss of instream habitat, and increased stream temperatures. Other potential effects resulting from construction and maintenance include alteration of stream banks and stream bottoms by heavy equipment and by herbicide runoff into streams.

Siltation has a detrimental effect on many aquatic animals adapted to riverine environments. Turbidity caused by suspended sediment can negatively impact spawning and feeding success of fish and mussel species (Brim Box and Mossa 1999; Sutherland et al. 2002).

For any alterations to perennial or intermittent streams, TVA would require SMZs to be implemented. Watercourses that convey only surface water during storm events (e.g., WWC/ephemeral streams and ponds) and that could be affected by the construction, operation, or maintenance would be protected by TVA's standard BMPs as identified in TVA (2022) and/or standard permit requirements. These BMPs are designed in part to minimize disturbance of riparian areas, and subsequent erosion and sedimentation that can be carried to streams or ponds.

TVA also provides additional categories of protection to watercourses directly affected by an Action Alternative based on the variety of species and habitats that exist in the streams, as well as the state and federal requirements to avoid harming certain species (see Appendix C). The width of the SMZs is determined by the type of watercourse, primary use of the water resource, topography, or other physical barriers (TVA 2022).

Applicable permits would be obtained prior to any construction for any stream alterations located within the proposed ROW. The terms and conditions of these permits would be followed including any required mitigation from the proposed activities. All perennial or intermittent watercourses and ponds identified in Appendix C within the proposed ROWs or crossed by proposed access roads would be protected by Standard Stream Protection (Category A) as defined in TVA (2022). This standard (basic) level of protection for streams and the habitats around them is aimed at minimizing the amount and length of disturbance to the water bodies without causing adverse impacts on the construction work.

Because appropriate BMPs would be implemented during construction, operations and maintenance activities, any impacts to aquatic ecology would be temporary and insignificant as a result of implementing the proposed Action Alternative. SMZs and BMPs would minimize the potential for impacts to water quality and instream habitat for aquatic organisms (TVA 2022). These guidelines outline site preparation standards with emphasis on soil stabilization practices, structural and sediment controls including runoff management, and general stream protection practices associated with construction activities.

Cumulative impact analysis considers stream loss at a watershed-level scale and includes current actions or those that would occur within the reasonable and foreseeable future. Since the transmission line conductors would span any watercourse within the ROW, no stream loss is anticipated because of the construction, operation, or maintenance of the proposed transmission line or access roads.

3.4. Vegetation

3.4.1. Affected Environment

The proposed project would occur in the Flatwoods/Blackland Prairie Margins Level IV ecoregion (Chapman et al 2004). This ecoregion is a transitional region that combines Flatwoods, which are comprised of a mostly forested lowland area of little relief, with soils that are very deep, clayey, somewhat poorly or poorly drained, and acidic, and Blackland Prairie Margins comprised of undulating, irregular plains, with slightly more relief than the Flatwoods, but also tend to have clayey soils that are sticky when wet, hard and cracked when dry, with generally poor drainage. Land cover is mostly mixed forest, pasture or hayland, and some cropland.

Field surveys were conducted in August 2023 and June 2024 to document plant communities, invasive plant populations, and to search for threatened and endangered plant species and their habitats in the proposed project areas. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys can be classified as a combination of deciduous forest, evergreen forest, and herbaceous vegetation. No forested areas in the proposed project area had structural characteristics indicative of old growth forest stands (Leverett 1996). The plant communities observed are common and well represented throughout the region, except for a few areas of blackland prairie remnants present in portions of the existing ROW and proposed new ROW. Evergreen forest, which accounts for about ten percent of total forest cover, has comparatively very low species diversity and the canopy is dominated by Virginia pine followed by eastern red cedar with some areas containing eastern hemlock. The herbaceous layer consisted mainly of poison ivy followed by Japanese honeysuckle.

Herbaceous vegetation is characterized by greater than 75 percent cover of forbs and grasses and less than 25 percent cover of other types of vegetation. The majority of this habitat type occurs along the existing transmission line ROW, but cropland, hayfields, and heavily grazed pastures also support herbaceous vegetation. Globally imperiled blackland prairie remnants were also observed in small parts of the existing ROW and proposed new ROW. Representative herbs observed include Indian grass, purple prairie clover, white prairie clover, fen Indian plantain, prairie mimosa, hairy wild petunia, prairie coneflower, compass plant, and American bluehearts. Areas of emergent wetlands were also present in the proposed project area. See Section 3.8 Wetlands for wetland species observed.

Deciduous forest, which is characterized by trees with overlapping crowns where deciduous species account for more than 75 percent of the canopy cover, occur throughout the project area. Common overstory species include willow oak, green ash, shagbark hickory, sugarberry and cherrybark oak. The midstory was comprised of musclewood, winged elm, sweetgum, black cherry, and Chinese privet. The herbaceous layer in these areas included Japanese honeysuckle, poison ivy, black snakeroot, and Virginia creeper. The deciduous forests in the project area have trees that average between 12- and 30-inches diameter at breast height, with several oaks reaching over 35 inches diameter at breast height. Areas of forested wetlands were present in the project area. See Section 3.8 Wetlands for species indicative of those areas.

Evergreen forests occur as plantations of loblolly pine intermixed with deciduous forests and occur scattered throughout the project area. Evergreen forests comprised of planted loblolly pine have low species diversity and bear little resemblance to a natural plant community. Midstory species included winged elm, sweetgum, and Chinese privet.

Understory species included Japanese honeysuckle, beautyberry, and poison ivy. The evergreen forests in the project area have trees that average between 5- and 15-inches diameter at breast height.

EO 13112 (Invasive Species) directs federal agencies to prevent the introduction of invasive species (both plants and animals), control their populations, restore invaded ecosystems and take other related actions. EO 13751 (Safeguarding the Nation from the Impacts of Invasive Species) amends EO 13112 and directs actions by federal agencies to continue coordinated federal prevention and control efforts related to invasive species. This order incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into federal efforts to address invasive species. Large portions of the project area were extensively altered in the past, resulting in the introduction and spread of invasive non-native plants. Common invasive plant species occurring include Chinese privet, Japanese honeysuckle, Johnson grass, sericea lespedeza, and white sweet clover. All these species occur widely across the landscape and have the potential to adversely impact the native plant communities because of their potential to spread rapidly and displace native vegetation.

3.4.2. Environmental Consequences

3.4.2.1. Alternative A – No Action

Under the No Action Alternative, areas within the proposed ROW and access roads would remain in their current condition. Thus, adoption of the No Action Alternative would not affect plant life because no project-related work would occur. Changes to local plant communities resulting from natural ecological processes and human-related disturbance would continue to occur, but the changes would not result from the proposed project.

3.4.2.2. Alternative B – Action Alternative

Adoption of the Action Alternative would not significantly affect the terrestrial ecology of the region. Converting forest land to herbaceous vegetation for the construction and operation of the proposed transmission line would be long-term in duration, but insignificant. About 313 acres of forest would require clearing. Virtually all the forest in the proposed project area has been previously cleared and the plant communities found there are mostly common and well represented throughout the region. Cumulatively, project-related effects to forest resources would be negligible when compared to the total amount of forest land occurring in the region. Most herbaceous plant communities found throughout the project area are heavily disturbed, early successional habitats dominated by invasive species.

However, a few small areas totaling around 4.0 acres support blackland prairie remnants, which are globally rare plant communities. TVA would avoid significant impacts to this plant community by implementing avoidance measures designed to minimize soil disturbance during construction activities (see Section 2.2 Construction, Operation and Maintenance). Carefully removing the woody plant species in these areas has the potential to benefit the blackland prairies by creating a more open community that was present in historical prairies. Project-related work would temporarily affect other herbaceous plant communities, but these areas would likely recover to their pre-project condition in less than one year.

Invasive terrestrial plants occur in nearly the entire project area and adoption of the Action Alternative would not significantly affect the extent or abundance of these species at the county, regional, or state level. The use of TVA standard operating procedures of

vegetating with noninvasive species (TVA 2022) would serve to minimize the potential introduction and spread of invasive species in the project area.

3.5. Wildlife

3.5.1. Affected Environment

Habitat assessments for terrestrial animal species were conducted in January and February 2023, August 2023, and May 2024. The proposed project area is primarily forested but also contains pastures, crop fields, and residential/developed areas. Forested areas in the project area are primarily evergreen and mixed deciduous/evergreen in composition. Wetlands, ponds, and streams occur in the project area. Small herbaceous areas are present between forest fragments and along edges of roads and agricultural fields. Overall, wildlife communities present in the project area are common to the region as habitats are not unique or uncommon.

Forests present within the project area are primarily deciduous and mixed evergreen-deciduous with areas of monoculture pine plantations scattered throughout. These forests provide habitat for an array of terrestrial animal species. Birds observed in this habitat include black-and-white warbler, blue-gray gnatcatcher, blue jay, Carolina wren, hooded warbler, and tufted titmouse. These areas also provide foraging and roosting habitat for several species of bat, particularly in areas where the forest understory is partially open. Common bat species likely found within this habitat include big brown bat, eastern red bat, evening bat, and silver-haired bat. Eastern chipmunk, southern flying squirrel, white-footed deermouse, gray fox, and raccoon are other common forest mammals in this region. Eastern box turtle and gray tree frog were observed. Red cornsnake, green anole, eastern fence lizard, and little brown skink are additional reptiles that can be found in forests in this region (Powell et al. 2016).

Early successional habitats containing native species are common and are present in some fragmented areas between forests and in small parcels along roadsides, field edges, and along portions of previously existing transmission rights-of-way. Common inhabitants observed in early successional habitat include black vulture, eastern towhee, northern harrier, red-tailed hawk, turkey vulture, and eastern cottontail. Bobcat, coyote, red fox, and whitetail deer are mammals typical of fields and cultivated land in this region (Whitaker 1996). Reptiles including eastern copperhead, eastern hog-nosed snake, and North American racer are also known to occur in this habitat type (Powell et al. 2016).

Developed areas were present at road crossings and residential areas within the project area and are home to a number of common species. Northern cardinal, mourning dove, blue jay, red-bellied woodpecker, and American crow are birds observed along road edges, parks, farms, and yards. Mammals observed or commonly found in this community type include eastern gray squirrel, eastern mole, woodchuck, striped skunk, and Virginia opossum (Whitaker 2002). Roadside ditches provide potential habitat for amphibians including American toad, southern cricket frog, and spring peeper. Reptiles potentially present include common five-lined skink, Dekay's brownsnake and common gartersnake (Powell et al. 2016).

Forested wetlands, scrub-shrub wetlands, emergent wetlands, riparian areas and ponds occur within the project area (see Section 3.8 Wetlands and Sections 3.2 Surface Water and 3.3 Aquatic Ecology for more details). Approximately 94.37 acres of wetland habitat was surveyed within the project area. Anhinga, great egret, green heron, northern harrier,

red-tailed hawk, and pileated woodpecker were observed at wetlands and water bodies during field survey. Golden mouse, southern short-tailed shrew, and muskrat are common mammals in emergent wetland and aquatic communities (Whitaker 1996). Pond slider, spiny softshell, common watersnake, and rough green snake are common reptiles likely present within this habitat (Powell et al. 2016). Amphibians likely found in wetlands in this area include Mississippi slimy salamander, three-lined salamander, eastern newt, marbled salamander, spotted salamander, green treefrog, Fowler's toad, and southern leopard frog (Powell et al. 2016).

Review of the TVA Regional Natural Heritage database in November 2022 indicated that no caves have been documented within 3 miles of the project area. No other unique or important terrestrial habitats were identified within the project area. In addition, no aggregations of migratory birds or wading bird colonies have been documented within 3 miles of the project area and none were observed during field surveys in January and February 2023, August 2023, or May 2024.

3.5.1.1. Migratory Birds

No bald eagle, osprey, or heron nests have been previously recorded within three miles of the project area and none were observed during field surveys of the proposed ROWs in January and February 2023, August 2023, or June 2024. Review of the USFWS's Information for Planning and Consultation website in October 2022 resulted in fourteen migratory bird species of conservation concern (American kestrel, Bachman's sparrow bald eagle, cerulean warbler, Kentucky warbler, lesser yellowlegs, prairie warbler, prothonotary warbler, red-headed woodpecker, rusty blackbird, short-billed dowitcher, willet, wood thrush, and yellow rail) identified as having the potential to occur in the project area. Suitable foraging habitat exists in the proposed ROWs for all these species. Suitable nesting habitat was observed in the proposed ROWs for each of these species except lesser yellowlegs, short-billed dowitcher, willet, rusty blackbird, and yellow-rail which breed elsewhere (National Geographic 2002). Individual nests, eggs, and juveniles of these species may be impacted by project actions, but migratory bird populations would not be impacted. Proposed actions are in compliance with the National Bald Eagle Management Guidelines (USFWS 2007).

3.5.2. Environmental Consequences

3.5.2.1. Alternative A – No Action

Under the proposed No Action Alternative, areas within the proposed ROWs, expanded ROWs and access roads would remain in their current condition and trees, soil, and vegetation would remain in their current state. Terrestrial animals and their habitats would not be affected under Alternative A.

3.5.2.2. Alternative B – Action Alternative

Under the proposed Action Alternative, TVA would build new transmission lines and associated access roads. While most of the proposed transmission line would be within existing ROW, approximately 19.3 miles of transmission line would involve new ROW. Actions within the proposed new ROW would include removing trees and other vegetation, as well as establishing transmission infrastructure and associated access roads.

Most wildlife currently using the project area would be temporarily displaced by habitat removal or alteration. Construction-associated disturbances and habitat removal would disperse mobile wildlife into surrounding areas. Species adapted to early successional

habitat would return after construction has ended and vegetation has returned. Less mobile individuals may be directly impacted by construction, particularly if clearing activities take place during breeding/nesting seasons. In these areas, impacts to wildlife habitat would be limited to locations where structure installation and tree removal for ROW establishment or widening would cause ground disturbance. Approximately 350 acres of forest would be removed and maintained as early successional habitat for the life of the transmission line, with approximately 177 acres removed from the 19.4-mile Midway-S. Macon portion in May 2025 and 173.27 acres from the 32.8-mile S. Macon-Scooba-DeKalb portion in April 2026. Species that require forested habitat would have to find new food and shelter sources and reestablish territories. However, the actions are not likely to affect populations of species common to the area, as similarly forested and habitat exists in the surrounding landscape.

Some migratory birds of conservation concern identified by the USFWS could be impacted by the proposed actions. Foraging habitat for fourteen species exists in the project area (see Section 3.5.1.1). Should mature individuals occur on site, they are expected to flush if disturbed. No direct mortality to adults is anticipated. Suitable nesting areas may be present for any of these except lesser yellowlegs, short-billed dowitcher, willet, rusty blackbird, and yellow-rail which breed elsewhere (National Geographic 2002). Nests, eggs, and juveniles may be destroyed by construction activities; however, it is not expected that populations of these migratory bird species would be impacted.

3.6. Endangered and Threatened Species

The Endangered Species Act (ESA) provides broad protection for species of fish, plants and wildlife that are listed as threatened or endangered in the U.S. or elsewhere. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize federally listed species. The policy of Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes.

The State of Mississippi (State) provides protection for species considered threatened, endangered, or deemed in need of management within the state other than those federally listed under the ESA. The listing is handled by the Mississippi Commission on Wildlife, Fisheries and Parks; however, the Mississippi Natural Heritage program and the TVA Regional Natural Heritage database both maintain a list of species considered threatened, endangered, of special concern, or tracked in Mississippi. Species listed under the ESA or by the State (see Table 3-3) are discussed in this section.

Table 3-3. Federally and State-listed Species from the Vicinity of the Proposed Midway-South Macon-Dekalb Power Improvement Project Area[1]

Common Name	Scientific Name	Federal Status[2]	State Status[2]	State Rank[3]
Aquatic Animals				
Fishes				
Freckled darter	*Percina lenticula*	–	CAND	S1
Mussels				
Alabama hickorynut	*Obovaria unicolor*	UR	-	S1
Rayed creekshell	*Strophitus radiatus*	UR	-	S2
Southern clubshell	*Pleurobema decisum*	E	END	S1
Southern hickorynut	*Obovaria arkansasensis*	-	-	S1

Common Name	Scientific Name	Federal Status[2]	State Status[2]	State Rank[3]
Plants				
American columbo	*Frasera caroliniensis*	–	SLNS	S2S3
American dragonhead	*Dracocephalum parviflorum*	–	SLNS	S1
Barrens silky aster	*Symphyotrichum pratense*	–	SLNS	S1
Beard-tongue	*Penstemon tenuiflorus*	–	SLNS	S3
Blue ash	*Fraxinus quadrangulata*	–	SLNS	S1
Blue waxweed	*Cuphea viscosissima*	–	SLNS	S1
Canada moonseed	*Menispermum canadense*	–	SLNS	S3
Canada wild ginger	*Asarum canadense var. reflexum*	–	SLNS	S3
Canadian milkvetch	*Astragalus canadensis*	–	SLNS	S2
Creamflower tick-trefoil	*Desmodium ochroleucum*	–	SLNS	S1
Ear-flower lobelia	*Lobelia appendiculata*	–	SLNS	S2S3
Earleaf foxglove	*Agalinis auriculata*	–	SLNS	S2
Eastern purple coneflower	*Echinacea purpurea*	–	SLNS	S3
Green violet	*Hybanthus concolor*	–	SLNS	S3
Limestone adder's-tongue	*Ophioglossum engelmannii*	–	SLNS	S2
Mock-orange	*Philadelphus inodorus*	–	SLNS	S2
Mountain-mint	*Pycnanthemum muticum*	–	SLNS	S2S3
Muhly grass	*Muhlenbergia sylvatica*	–	SLNS	S2
Prairie pleatleaf	*Nemastylis geminiflora*	–	SLNS	S2
Price's potato-bean	*Apios priceana*	THR	SLNS	S1
Shadow-witch orchid	*Ponthieva racemosa*	–	SLNS	S2
Shellbark hickory	*Carya laciniosa*	–	SLNS	S2
Slender sedge	*Carex gracilescens*	–	SLNS	S1S2
Spreading rockcress	*Arabis patens*	–	SLNS	S1
Swamp hickory	*Carya glabra var. hirsuta*	–	SLNS	S3
Texas aster	*Symphyotrichum drummondii var. texanum*	–	SLNS	S3
Upland swamp privet	*Forestiera ligustrina*	–	SLNS	S1S2
Wahoo	*Euonymus atropurpureus*	–	SLNS	S2S3
White heath aster	*Symphyotrichum drummondii var. texanum*	–	SLNS	S2
Yellowwood	*Cladrastis kentukea*	–	SLNS	S2
Terrestrial Animals				
Invertebrates				
Monarch butterfly[4]	*Danaus plexippus*	CAND	–	S5
Reptiles				
Alligator snapping turtle[7]	*Macrochelys temminckii*	PT	-	
Black-knobbed map turtle	*Graptemys nigrinoda*		END	
Ringed map turtle[7]	*Graptemys oculifera*		-	
Birds				
Bald eagle[5]	*Haliaeetus leucocephalus*	DM	-	S3B, S2N
Red-cockaded woodpecker[5,6]	*Picoides borealis*	END, PT	END	S1
Mammals				
Northern long-eared bat[7]	*Myotis septentrionalis*	END	-	SH
Tricolored bat	*Perimyotis subflavus*	PE	-	S3

[1] Sources: TVA Regional Natural Heritage database (accessed October 2023); and USFWS Ecological Conservation Online System (http://ecos.fws.gov/ipac) (accessed July 2023)

[2] Status Codes: CAND = Candidate for federal listing; DM = Deemed in Need of Conservation/Management; END = Endangered; PE = Proposed Endangered; PT=Proposed Threatened; SPCO = Special Concern; S-CE = Special Concern/Commercially Exploited; THR = Threatened

[3] State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; SH = Possibly Extirpated; S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2)

[4] Candidate species for listing under the Endangered Species Act that has the potential to occur in the project area.
[5] Federally listed species which are known to occur from Noxubee County but not within 3 miles of the project area.
[6] Federally listed species which are known to occur from Winston County but not within 3 miles of the project area.
[7] Federally listed species that has not been documented within 3 miles of the project area or from Noxubee or Winston Counties; USFWS has determined this species has the ability to occur in the project area.

3.6.1. Affected Environment

3.6.1.1. Aquatic Animals

A query of the TVA Regional Natural Heritage database and the USFWS's Information for Planning and Consultation (IPaC) indicated one federally listed mussel, and four additional species (one fish, three mussels) that are currently tracked by the Mississippi Natural Heritage program are known from the potentially affected 10-digit HUC watersheds of the proposed project area (see Section 3.2 Surface Water and Table 3-3). More about these species are described below.

The southern clubshell is known from the Mobile Basin in Alabama, Georgia, Mississippi and Tennessee, and typically inhabits large creeks and small rivers in areas with sand and gravel substrates (Williams et al. 2008). Although this species has been documented in nearby drainages such as Bogue Chittoe Creek in Pickens County, Alabama, its current known distribution does not include any of the watersheds that are crossed by the proposed project area (USFWS 2019).

The freckled darter is known from the Mobile Basin in Alabama and Mississippi and the Pascagoula and Pearl drainages in Mississippi. This species generally inhabits deep sections of large streams and rivers and has been observed in rapids with swift current as well as slackwater areas with little to no current (Boschung and Mayden 2004).

The Alabama hickorynut and rayed creekshell are both known to inhabit small to medium-sized rivers in areas with slow to moderate current, with sand and gravel substrates (Williams et al. 2008). The southern hickorynut is known to occur in large streams and small to medium-sized rivers in areas with slow to moderate current with sand and gravel substrates (Williams et al. 2008). It is currently tracked by the Mississippi Natural Heritage Program but does not have state or federal listing status.

3.6.1.2. Plants

Review of the TVA Regional Natural Heritage database indicated that that one federally and 28 state listed plants have been previously reported from within 5 miles of the project area (Table 3-3). Potential habitat for the federally listed Price's potato bean was located within the project area but no individuals were found during botanical surveys of those areas. Most of the potential area was disturbed and populated with an abundance of invasive species. Designated critical habitat for plants does not occur within the project area and no state or federally listed plants were observed in the proposed project area.

Shellbark hickory, a rare state ranked species was found in the project footprint. Seven individuals ranging from 10-20 inches diameter at breast height were found in a bottomland forest above a stream bank roughly 4.5 miles north of Scooba.

3.6.1.3. Terrestrial Animals

A review of the TVA Regional Natural Heritage database indicated one state-listed species (black-knobbed map turtle) and no federally listed terrestrial animals are known to occur within 3 miles of the proposed project area. The federally protected bald eagle is known to occur from Noxubee County. The federally listed red-cockaded woodpecker is known from Noxubee and Winston counties. The federally listed alligator snapping turtle, northern long-eared bat, and ringed map turtle are thought by USFWS to have the potential to occur in Noxubee and Winston counties, although no records of their presence are known to date (Table 3-3). Habitat suitability and potential impacts to each of the terrestrial animal species in Table 3-3 have been described below.

Species Accounts

Monarch butterflies are a highly migratory species, with eastern U.S. populations overwintering in Mexico. Summer breeding habitat in the U.S. requires milkweed plant species, on which adults exclusively lay eggs for larvae to develop and feed on. Adults will drink nectar from other blooming wildflowers when milkweeds are not in bloom. Suitable early successional habitat is present in the proposed ROW abut none were observed in the project area.

Alligator snapping turtles are proposed threatened by USFWS. This highly aquatic reptile emerges from water only for nesting, and rarely for basking. This species is restricted to river and stream drainages which flow into the Gulf of Mexico. These turtles are found in floodplain swamps and oxbow lakes associated with large rivers but do not occur in isolated wetlands and ponds. Most nesting occurs May to July. USFWS has determined that alligator snapping turtles may occur in Noxubee and Winston counties, though no records are known, and none were observed in the project area.

Bald eagles are protected under the Bald and Golden Eagle Protection Act. This species is associated with larger mature trees capable of supporting its massive nest. Bald eagles are usually found near larger waterways where the eagles forage. Active nesting for bald eagles typically occurs December to June. Potentially suitable foraging and nesting habitat occurs throughout the proposed project area over wetlands, streams, and ponds. One bald eagle nest record is known from Noxubee County, approximately 7.77 miles from the proposed ROW and none were observed in the project area.

Black-knobbed map turtles typically inhabit moderately flowing streams with sandy shorelines they use for basking and nesting. All known populations of this species can be found in the Mobile Bay drainage. Nesting likely occurs July to September. Potentially suitable habitat for this species is not present in the project area as stream sides are typically steep and vegetated. One record of black-knobbed map turtle is known within 1.66 miles of the proposed project area, and none were observed in the project area.

The northern long-eared bat predominantly overwinters in large hibernacula, such as caves and abandoned mines. During the fall and spring, this species utilizes entrances of caves and surrounding forested areas for swarming and staging. There are no documented caves within 3 miles of the project area, and none were observed during field surveys. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees greater than 3 inches in diameter. This species is also known to roost in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas. All of these habitat types are

abundant within the proposed project area. Assessment of the project area for presence of summer roosting habitat for the northern long-eared bat followed USFWS survey guidelines (USFWS 2023) and resulted in the identification of seven suitable forested areas and four additional solitary trees were observed in January to February 2023, totaling 57.15 acres. An additional 23 suitable forested areas and three additional solitary trees were observed in August 2023 and May 2024, totaling 26.65 acres. A total of 83.8 acres of suitable forested areas were observed in the project area. USFWS has determined that northern long-eared bats may occur in Noxubee and Winston counties although no records are known, and none were observed in the project area.

Red-cockaded woodpeckers typically inhabit open, mature pine forests with a dense groundcover consisting of a variety of grass, forb, and shrub species. These woodpeckers are thought to be extirpated from most of their habitat. With regards to management, it is extremely important to protect and encourage the development of large, mature pines throughout the landscape. Protection of existing cavity trees, providing artificial cavities and application of frequent fire to both clusters and foraging habitat are all actions meant to accomplish recovery and delisting. Twenty-six records of this species are known from Noxubee and Winston counties, the nearest occurring from Winston County approximately 5.19 miles from the proposed project area and none were observed in the project area.

Ringed map turtles are found in the Pearl River system and is not typically found in tributaries or tidal areas. They are most abundant in streams with a moderate to fast current that contain numerous basking logs in close proximity to sand and gravel bars. Mating occurs at the end of April and eggs are laid in nests dug in sandy beaches or in sandbars from mid-May to mid-June. The young emerge from the nest in late July or early August. USFWS has determined this species exists in Noxubee and Winston counties although no records are known, and none were observed in the project area.

Tricolored bat is a species that is under review for federal listing. This species is generally solitary or found in small groups. They are associated with forested landscapes where they forage near trees and along waterways, especially riparian areas. Maternity and other summer roosts are mainly in dead or live tree foliage. Caves, mines, culverts, and rock crevices may be used as night roosts and hibernacula. USFWS has determined this species exists in Noxubee and Winston counties although no records are known, and none were observed in the project area.

3.6.2. Environmental Consequences

3.6.2.1. Alternative A – No Action

Under the No Action Alternative, areas within the proposed ROWs, expanded ROWs and access roads would remain in their current condition. Changes to the area would nonetheless occur over time, as factors such as population trends, land use and development, quality of air, water, and soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Adoption of the No Action Alternative would not impact federally listed animals or plants, designated critical habitat, or state-listed animals or plants species because no project-related work would occur. Changes to the proposed project area resulting from natural ecological processes and human-related disturbance would continue to occur. These changes may benefit or negatively affect animals and plants present in the proposed project area, but the changes would be unrelated to the proposed project.

3.6.2.2. Alternative B – Action Alternative

3.6.2.2.1. Aquatic Animals

As indicated in Section 3.2 Surface Water, adverse water quality impacts can potentially result from the implementation of the proposed project, which could have direct and indirect impacts to aquatic biota within watercourses in the project area.

As stated in Section 3.3 Aquatic Ecology, aquatic species could be affected by the proposed action directly or indirectly should adverse water quality impacts result from the implementation of the proposed project. The streams documented within the proposed project area would be protected by standard BMPs and additional protection measures as identified in Appendix C and described in TVA (2022) or as required by standard permit conditions. These categories of protection are based on the variety of species and habitats that exist in the streams as well as the state and federal requirements to avoid harming certain species.

The federally endangered southern clubshell has been documented in drainages nearby to the proposed project such as Bogue Chittoe Creek in Pickens County, Alabama (about 15 miles from the proposed project). However, it is not currently known to occur in any of the watersheds crossed by the proposed project (USFWS 2019). It is therefore not anticipated to occur in any of the streams listed in Appendix C and would not be impacted by activities associated with the proposed project. The remaining four aquatic species listed in Table 3-3 are currently tracked by Mississippi Natural Heritage Program, but do not yet have federal or state-listing status. Furthermore, no federally designated critical habitat is known from the potentially affected 10-digit HUC watersheds of the proposed project area. Therefore, with implementation of BMPs during construction, operation, and maintenance of the transmission line and ROW, no impacts to federally or state-listed aquatic species are anticipated to occur as a result of implementing the proposed Action Alternative.

3.6.2.2.2. Plants

Adoption of the Action alternative would not affect federally listed plant species or designated critical habitat because neither occurs in the existing ROW, proposed ROW, or along proposed access roads. Seven individuals of state-monitored shellbark hickory would be impacted by project activities. Shellbark hickory is a rare species monitored by the Mississippi Natural Heritage Program. A query of the TVA Regional Natural Heritage database shows nineteen occurrences of shellbark hickory in Mississippi. Shellbark hickory is widely distributed and is more prominent in Midwestern states. The loss of the population would not result in significant impacts to the species due to the species relative abundance across the state and region. Therefore, no direct, indirect, or cumulative impacts on endangered and threatened species and their critical habitats are anticipated as a result of implementing the Action Alternative.

3.6.2.2.3. Terrestrial Animals

Under the proposed Action Alternative, actions would include removing trees and other vegetation within the existing and proposed ROWs, establishing transmission infrastructure, and associated access roads.

Suitable early-successional habitat is in the project area. This habitat may contain milkweed species required for the larval stage of the monarch butterfly or nectaring flowers for the adults. Although individual eggs or larvae may be impacted during construction, creation of early-successional ROW habitat may ultimately benefit this species. This

species is currently listed under the ESA as a candidate species and is not subject to Section 7 consultation under the ESA.

Black-knobbed map turtles are unlikely to occur within the proposed project are due to the stream and bank composition observed. Though some small streams are present, the banks are steep, are vegetated, and offer no sandy areas for basking or apparent nesting habitat based on field review conducted in January to February 2023, August 2023, and May 2024. With the use of BMPs to prevent sedimentation and herbicide inputs to streams, proposed actions are not likely to adversely affect black-knobbed map turtles.

Ringed map turtles are found in the Pearl River system and are not typically found in tributaries or tidal areas. No records of this species are known from Noxubee or Winston counties. Suitable nesting habitat for ringed map turtle was not observed in the project action area during field review conducted in January to February 2023, August 2023, or May 2024. Proposed actions are not likely to adversely affect ringed map turtles.

No bald eagle nests or individuals were observed during field surveys, but bald eagles could potentially occur in the proposed project area. Potential foraging habitat for this species is present in streams, ponds, and wetlands throughout the project area. With the use of BMPs to minimize impacts to water quality and hydrology and prevent sedimentation and herbicide inputs into streams, proposed actions are not likely to adversely affect bald eagles.

Red-cockaded woodpeckers, though present in Noxubee and Winston counties, are not likely to be present in the proposed project action area. Field review conducted by TVA in January to February 2023 resulted in no observations of potentially suitable habitat for this species within the proposed project area. Proposed actions are not likely to adversely affect red-cockaded woodpecker.

Northern long-eared bat foraging habitat exists over ponds, streams, and wetlands within the proposed ROW. BMPs would be utilized in SMZs around these bodies of water, thus minimizing impacts to water quality. Additional foraging habitat for this species exists within forests. This foraging habitat would be removed in the project area association with the proposed actions. However, similarly suitable foraging habitat is plentiful in the surrounding landscape. No caves, cave-like structures, or other winter hibernacula for these species exist in the project footprint or would be impacted by the proposed actions. Summer roosting habitat is present within the proposed ROW and this species may be impacted by tree clearing if they are roosting in them at the time. Assessment of the project area for presence of summer roosting habitat for the northern long-eared bat resulted in the identification of 83.8 acres of suitable forested areas in the project area.

Tricolored bat foraging habitat exists over ponds, streams, and wetlands within the proposed ROW. BMPs would be utilized in SMZs around these bodies of water, thus minimizing impacts to water quality. Additional foraging habitat for this species exists within forests. This foraging habitat would be removed in association with the proposed actions. However, similarly suitable foraging habitat is plentiful in the surrounding landscape. No caves, cave-like structures, or other winter hibernacula for these species exist in the project footprint or would be impacted by the proposed actions. Summer roosting habitat is present within the proposed ROW. Proposed actions would not jeopardize the existence of tricolored bat

Activities associated with the proposed project were addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and completed in April 2018, updated in April 2023, and November 2024. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures when impacts to federally listed bat species are expected. Relevant conservation measures to this project are identified in the bat strategy form and must be reviewed and implemented as part of the approved project.

Assessment of the proposed project area for presence of summer roosting habitat for the northern long-eared bat resulted in the identification of 83.8 acres of suitable forested areas in the project area. Summer roosting habitat is also present within the proposed ROW for tricolored bat. Due to constraints on the project schedule, TVA may not be able to clear vegetation during the inactive season from November 16th to March 14th to avoid direct impacts to bat species. So, construction may occur during the potential roosting season from March 15th to November 15th so tree and vegetation clearing could potentially have direct impacts to bat species.

TVA would apply one non-routine measure during construction of the proposed transmission lines and access roads to reduce the potential for adverse environmental effects. Because removal of suitable summer roosting habitat would likely occur when bats may be present on the landscape, TVA would contribute funding based on amount of habitat removed towards future conservation and recovery efforts for federally listed bats. Upon activity completion, the funds would be contributed to TVA's Bat Conservation Fund.

The proposed actions may affect and are likely to adversely affect the federally endangered northern long-eared bat and proposed endangered tricolored bat if individuals are present during tree clearing. However, activities associated with this project were addressed in TVA's programmatic consultation with the U.S. Fish and Wildlife Service on routine actions and federally listed bats in accordance with Endangered Species Act Section 7(a)(2). For those activities with potential to affect bats, TVA committed to implement specific conservation measures. Relevant conservation measures must be reviewed and implemented as part of the approved project. Impacts to populations of other listed species are not expected. The proposed actions are in compliance with the National Bald Eagle Management Guidelines (USFWS 2007).

3.7. Floodplains

3.7.1. Affected Environment

A floodplain is the relatively level land area along a stream or river that is subjected to periodic flooding. The area subject to a 1 percent chance of flooding in any given year is normally called the 100-year floodplain. The area subjected 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 the floodplain to ensure that the project is consistent with the requirements of EO 11988 (Floodplain Management).

The proposed transmission lines and several access roads would cross the 100-year floodplains of Wolf Creek, Hashuqua Creek, Poplar Creek, the Noxubee River, Dry Creek, Macedonia Creek, Shuqualak Creek, Little Scooba Creek, Flat Scooba Creek, Big Scooba Creek, Wahalak Creek, and the Sucarnoochee River and several tributaries in Kemper, Noxubee, and Winston counties.

3.7.2. Environmental Consequences

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 possible 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 (U.S. Water Resources Council 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

For certain "critical actions," the minimum floodplain of concern is the 500-year floodplain. The U.S. Water Resources Council defines "critical actions" as "any activity for which even a slight chance of flooding would be too great" (U.S. Water Resources Council 1978). Critical actions can include facilities producing hazardous materials (such as liquefied natural gas terminals), facilities whose occupants may be unable to evacuate quickly (such as schools and nursing homes), and facilities containing or providing essential and irreplaceable records, utilities, and/or emergency services (such as large power-generating facilities, data centers, hospitals, or emergency operations centers).

EO 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) was reinstated by President Biden in May 2021. However, implementation of EO 13690 is still in development at the national level. TVA is working with other federal agencies to develop consistent implementing plans for these EO requirements and may update its implementing plan when federal guidance is finalized. TVA currently incorporates floodplain analyses with respect to the 500-year floodplain in alignment with EO 13690, in addition to EO 11988.

3.7.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not acquire new ROW to construct the new transmission lines, expand existing ROW, or construct new access roads. Therefore, no impacts to floodplains in the project area would occur as a result of TVA.

3.7.2.2. Alternative B – Action Alternative

Under the Action Alternative, the proposed transmission line and several access roads would cross the 100-year floodplains of two rivers and several creeks and tributaries in Kemper, Noxubee, and Winston counties. Appendix D, Figures D-1 through D-23, illustrates the locations where the proposed transmission lines, access roads, or both would cross floodplains. Consistent with EO 11988, overhead transmission lines and related support structures are considered repetitive actions in the 100-year floodplain that should result in minor impacts.

The support structures for the proposed transmission lines would not be expected to result in any increase in flood hazard, either as a result of increased flood elevations or changes in flow-carrying capacity of the streams being crossed. Construction in the floodplain would be consistent with EO 11988 provided the TVA subclass review criteria for transmission line location in floodplains are followed (TVA 1980).

While the proposed transmission line ROWs would cross floodplains, none of the proposed structures would be located withing the 100-year floodplain. But portions of multiple access roads would be located within the 100-year floodplain. Based upon a review of FEMA

Flood Insurance Rate Map (FIRM) panels in Kemper, Noxubee, and Winston counties and a topographic map review in the Wahalak Creek area, portions of access road (AR) AR38, AR65, AR66, AR70, AR71, AR76, AR83, AR86, AR89, AR90, AR100, AR112, AR120, AR122, AR125, AR126, AR138, AR143, AR147, AR163, AR174, AR179, AR183, AR204, AR209, AR222, AR223, AR228, AR237, AR238, AR271, AR272, AR300, AR395, AR397, AR400, AR414, and the access road between Structures 291 and 292 would be located within the 100-year floodplain. Consistent with EO 11988, access roads are considered repetitive actions in the 100-year floodplain that should result in minor impacts (TVA 1981). To minimize adverse impacts, any road improvements in 100-year floodplains, but not floodways, would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot.

The following routine mitigation measures would be implemented throughout the project area to minimize potential impacts to floodplains and floodways:

- Standard BMPs would be used during construction activities.
- Any road improvements or construction in the floodplain but not floodways would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot.

Kemper County participates in the National Flood Insurance Program, and any development would be consistent with its floodplain regulations. Portions of access road AR174 would be located within the 100-year floodway of Little Scooba Creek, as shown on the FIRM aerial map (Figure FP-1 in Appendix D). The following non-routine mitigation measures are needed to prevent an obstruction in the Little Scooba Creek floodway:

- Construction would adhere to the TVA subclass review criteria for transmission line location in floodplains.
- Any fill, gravel or other modifications in the Little Scooba Creek floodway that extend above the pre-construction road grade would be removed after completion of the project, excess material would be spoiled outside of published floodways, and the area would be returned to its pre-construction condition.

By implementing the routine and non-routine mitigation measures above, the proposed project would have no significant impact on floodplains and their natural and beneficial values.

3.8. Wetlands

3.8.1. Affected Environment

Wetlands are those areas inundated or saturated by surface or groundwater such that vegetation adapted to saturated soil conditions are prevalent. Examples include bottomland forests, swamps, wet meadows, isolated depressions, and fringe wetland along the edges of watercourses and impoundments. Wetlands provide many societal benefits such as toxin absorption and sediment retention for improved downstream water quality, storm water impediment and attenuation for flood control, shoreline buffering for erosion protection, and provision of fish and wildlife habitat for commercial, recreational, and conservation purposes.

Wetland assessments were performed in the proposed project area to ascertain wetland presence, condition, and extent to which wetland functions are provided within the

proposed project area. Weland field surveys along the Midway-S. Macon section of the project were conducted in December 2022, January through February of 2023, and the associated access roads were surveyed May 2024. Field surveys along the S. Macon-Scooba-Dekalb section of the project were conducted in July through August 2023 and the associated access roads were surveyed in April and May of 2024.

Wetland determinations were performed according to the USACE standards, which require documentation of hydrophytic (wet-site) vegetation, hydric soil, and wetland hydrology (Environmental Laboratory 1987; USACE 2010). Using the TVA Rapid Assessment Method (TVARAM) wetlands were evaluated by their functions and classified into three categories: low, moderate quality, or exceptional resource value (TVA 2010).

- Low quality wetlands are degraded aquatic resources which may exhibit low species diversity, minimal hydrologic input and connectivity, recent or on-going disturbance regimes, and/or predominance of non-native species. These wetlands provide low functionality and are considered low value.

Moderate quality wetlands provide functions at a greater value than low quality wetlands due to less degradation and/or due to their habitat, landscape position, or hydrologic input. Moderate quality wetlands are considered healthy water resources of value. Disturbance to hydrology, substrate and/or vegetation may be present to a degree at which valuable functional capacity is sustained.

- Wetlands with exceptional resource value provide high functions and values within a watershed or are of regional/statewide concern. Those wetlands would exhibit little, if any, recent disturbance, provide essential and/or large-scale stormwater storage, sediment retention, and toxin absorption, contain mature vegetation communities, and/or offer habitat to rare species.

Eighty-eight (88) wetland areas, totaling approximately 101.59 acres, were identified within the proposed project area (Appendix E). These wetlands consisted of 25.41 acres of emergent, 5.69 acres of scrub-shrub (sapling dominated), and 70.49 acres of forested wetland habitat of varying levels of condition, thus providing a range of wetland function and value to the surrounding landscape (Table 3-4 and Table 3-5, Appendix E). The delineated wetlands were generally identified in association with smaller to medium sized drainage features and larger floodplain bottoms. Tables 3-4 and 3-5 identify the wetland acreages and types by watershed within the project area. The combination of land-use practices and landscape position dictates the wetland habitat type, wetland functional capacity, and wetland value.

Table 3-4. Acreage of Low, Moderate and Exceptional Resource Value Wetlands by Watershed Within the Proposed Project Area

Watershed (10-HUC)	NWI Estimated Total Wetland Acres in Watershed[1]	Delineated Wetland Acreage in Project Area			
		Low Value	Moderate Value	Exceptional Resource Value	TOTAL
Hashuqua Creek (0316010804)	16,140	0.82	4.85	0	**5.67**
Horse Hunters Creek-Noxubee River (0316010805)	9,840	0.83	17.22	0	**18.05**
Shuqualak Creek-Noxubee River (0316010807)	14,700	1.32	22.83	0	**24.15**
Running Water Creek-Macedonia Creek (0316010806)	6,535	8.65	0.86	0	**9.51**
Wahalak Creek (0316010808)	5,205	0.36	8.86	0	**9.23**
Bodka Creek (0316010810	23,100	16.28	13.14	0	**29.42**
Running Tiger Creek-Sucarnoochie River (0316020201)	13,485	3.17	2.40	0	**5.57**
TOTAL	**89,005**	**31.43**	**70.16**	**0.00**	**101.59**

[1]National Wetland Inventory (USFWS 1982)

Emergent Wetlands

Emergent wetland areas within the proposed project area totaled approximately 25.41 acres across forty-seven (47) delineated wetland areas (Appendix E, Table 3-6). Emergent wetlands are generally devoid of woody vegetation with predominant cover by non-woody species across areas periodically saturated and/or inundated. The emergent wetland habitat encountered within the proposed project area comprised approximately 0.37 percent of the total estimated emergent wetland habitat within the project watersheds (Table 3-6). Emergent wetlands are a significant component of the wetland area and general landscape in this vicinity. Much of the proposed project area is located within existing transmission line ROWs that are maintained to sustain low-stature vegetation in areas otherwise prone to recruitment of woody species.

Table 3-5. Acreage of Delineated Wetland Habitat Type by Watershed Within the Proposed Project Area

Watershed (10-HUC)	NWI Estimated Total Wetland Acres in Watershed	Delineated Total Wetland Acreage in Proposed Project			
		Emergent	Scrub-Shrub	Forested	TOTAL
Hashuqua Creek (0316010804)	16,140	0.82	0	4.85	**5.67**
Horse Hunters Creek-Noxubee River (0316010805)	9,840	0.83	0.89	16.33	**18.05**
Shuqualak Creek-Noxubee River (0316010807)	14,700	1.07	4.79	18.27	**24.14**
Running Water Creek-Macedonia Creek (0316010806)	6,535	6.21	0	3.30	**9.51**
Wahalak Creek (0316010808)	5,205	0	0	9.23	**9.23**
Bodka Creek (0316010810	23,100	10.91	0	18.51	**29.42**
Running Tiger Creek-Sucarnoochie River (0316020201)	13,485	5.57	0	0	**5.57**
TOTAL	**89,005**	**25.41**	**5.69**	**70.49**	**101.59**

Emergent wetlands in the vicinity are often found where land use practices deter growth of woody species. This was evident for the identified emergent wetland areas within the project area. Emergent wetlands primarily occurred along existing highway and transmission ROWs, within low-lying areas of pastures, and artificially cleared areas. TVA's ROW vegetation management program targets eradication of woody vegetation through herbicide application and other methods within TVA's existing ROWs comprising the project area. This has resulted in the emergent wetland habitat type found along the existing ROW. Typical wetland grasses, rushes, and forbs dominated these habitats. This included broomsedge, yellow nutsedge, plumegrass, cattail, common rush, fox sedge, redtop panicum, smartweed, woolgrass, spikerush, rivercane, rice cutgrass, giant cane, field blackberry, smartweed, velvet panicum, goldenrod, balloon vine, and panic grasses (Appendix E - USACE). Condition and functional capacity of these wetlands was generally low in quality, largely due to or dependent on size, landscape position, hydrologic influence, and degree of impacts evident (e.g. grazing, farming, woody vegetation control, soil compaction, mowing, etc.) (Table 3-6, Appendix E - TVARAM).

Table 3-6. Acreage of Low, Moderate, and Exceptional Resource Value Emergent Wetlands by Watershed Within the Proposed Project Area

Watershed (10-HUC)	NWI Estimated Emergent Wetland Acres in Watershed	Delineated Emergent Wetland Acreage in Proposed Project Area			
		Low Value	Moderate Value	Exceptional Resource Value	TOTAL
Hashuqua Creek (0316010804)	495	0.82	0	0	**0.82**
Horse Hunters Creek-Noxubee River (0316010805)	1,580	0.83	0	0	**0.83**
Shuqualak Creek-Noxubee River (0316010807)	2,030	1.07	0	0	**1.07**
Running Water Creek-Macedonia Creek (0316010806)	300	6.11	0.10	0	**6.21**
Wahalak Creek (0316010808)	185	0	0	0	**0.00**
Bodka Creek (0316010810	1,325	10.35	0.56	0	**10.91**
Running Tiger Creek-Sucarnoochie River (0316020201)	950	3.17	2.40	0	**5.57**
TOTAL	**6,865**	**22.35**	**3.07**	**0.00**	**25.41**

A summary of emergent wetlands delineated within each watershed shown in Table 3-6 is provided below.

The Hashuqua Creek watershed contains emergent wetlands W011, W012, W014, and W015 within the proposed new ROW corridor. Of an estimated total 495 acres of emergent wetland within the Hashuqua Creek watershed, the proposed ROW corridor contains 0.82 acre, or approximately 0.17 percent.

The Horse Hunters Creek-Noxubee River watershed contains emergent wetland W019b within the proposed new ROW. Of an estimated total 1,580 acres of emergent wetlands within the Horse Hunters Creek-Noxubee River watershed, the proposed ROW corridor contains 0.83 acre, or about 0.05 percent.

The Shuqualak Creek-Noxubee River watershed contains emergent wetlands W036 to W039, W041, and W044 within the proposed ROW. Of an estimated total 2,030 emergent wetland acres, the proposed ROW corridor through this watershed contains 1.07 acres, or about 0.05 percent.

The Running Water Creek-Macedonia Creek watershed contains emergent wetlands W029, W030, W031b, W032b, W033b, and W034b within the proposed ROW corridor. Of an estimated total 300 acres of emergent wetland, the proposed ROW corridor through this watershed contains 6.21 acres, or less than 2.07 percent.

The Wahalak Creek watershed does not contain any emergent wetlands within the proposed ROW corridor.

The Bodka Creek watershed contains emergent wetlands W058a, W059b, and W061-W078 within the proposed ROW corridor. Of an estimated total 1,325 acres of emergent wetlands, the proposed ROW corridor through this watershed contains 10.91 acres, or less than 0.82 percent.

The Running Tiger Creek-Sucarnoochie River watershed contains emergent wetlands W079 to W088 within the proposed ROW corridor. Of an estimated total 950 acres of emergent wetland, the proposed ROW corridor through this watershed contains 5.56 acres, or less than 0.59 percent.

Scrub-shrub Wetlands

Scrub-shrub wetlands are dominated by woody vegetation generally 3 to 20 feet tall and larger than 3 inches in diameter at breast height (Cowardin et al. 1979). This habitat type totaled approximately 5.69 acres across two delineated wetland areas (W018 and W022) within the proposed project area (Appendix E, Table 3-5, Table 3-7). The scrub-shrub wetland habitat encountered comprised 0.08 percent of the total estimated scrub-shrub wetland habitat across the project watersheds (Table 3-7). In the proposed project area, this habitat type is comprised of young saplings in early successional forest (scrubby), such as previously clearcut areas. W018 and W022 appeared to have been historically cleared but left fallow such that saplings comprising early successional forest habitat were present. Due to their landscape position, size, disturbance regime, and hydrologic influence, these wetlands were assessed as providing moderate wetland value within the surrounding landscape (Appendix E). Delineated scrub-shrub wetland areas exhibited wetland hydrology indicators and hydric soil coloration within the soil profile. Hydrophytic saplings, such as water oak, sweetgum, black willow, and green ash were dominant across these wetlands (Appendix E).

Table 3-7. Acreage of Low, Moderate, and Exceptional Resource Value Scrub-Shrub Wetlands by Watershed Within the Proposed Project Area

Watershed (10-HUC)	NWI Estimated Scrub-Shrub Wetland Acres in Watershed	Delineated Scrub-Shrub Wetland Acreage in Proposed Project Area			
		Low Value	Moderate Value	Exceptional Resource Value	TOTAL
Hashuqua Creek (0316010804)	610	0	0	0	**0.00**
Horse Hunters Creek-Noxubee River (0316010805)	692	0	0.89	0	**0.89**
Shuqualak Creek-Noxubee River (0316010807)	1,260	0	4.79	0	**4.79**
Running Water Creek-Macedonia Creek (0316010806)	544	0	0	0	**0.00**

Watershed (10-HUC)	NWI Estimated Scrub-Shrub Wetland Acres in Watershed	Delineated Scrub-Shrub Wetland Acreage in Proposed Project Area			
		Low Value	Moderate Value	Exceptional Resource Value	TOTAL
Wahalak Creek (0316010808)	410	0	0	0	**0.00**
Bodka Creek (0316010810	2,375	0	0	0	**0.00**
Running Tiger Creek-Sucarnoochie River (0316020201)	935	0	0	0	**0.00**
TOTAL	**6,826**	**0**	**5.69**	**0**	**5.69**

A summary of scrub-shrub wetlands delineated within the watersheds shown in Table 3-7 is provided below.

The Horse Hunters Creek-Noxubee River watershed contains W018. Of an estimated total 692 acres of scrub-shrub wetland, the proposed ROW through this watershed contains 0.89 acres, or less than 0.13 percent.

The Shuqualak Creek-Noxubee River watershed contains W022. Of an estimated total 1,260 acres of scrub-shrub wetland, the proposed ROW through this watershed contains 4.79 acres, or less than 0.38 percent.

The other watersheds do not contain any scrub-shrub wetlands within the proposed ROW corridor.

Forested Wetlands

Forested wetlands have deeper root systems and contain greater biomass (quantity of living matter) per acre than emergent and scrub-shrub wetlands, which do not grow as tall. As a result, forested wetlands provide higher levels of wetland functions, such as sediment retention, carbon storage, and pollutant retention and transformation (detoxification), storm water storage, and flood attenuation, all of which support better water quality and protection of downstream infrastructure (Ainslie et al. 1999; Scott et al. 1990; Wilder and Roberts 2002). Approximately 63.26 acres of forested wetlands were delineated across fifty (50) wetland areas within the proposed ROWs (Appendix E, Table 3-4, Table 3-8). The forested wetland habitat encountered comprised 0.08 percent of the total estimated forested wetland area across the project watersheds (Table 3-8). Due to landscape position, buffer composition, hydrologic influence, disturbance history, and habitat features, these forested wetlands varied in condition and associated value provided to the surrounding watershed from low to moderate. The majority of forested wetlands within the ROW corridor provide moderate resource value (Appendix E and Table 3-8).

A summary of forested wetlands delineated within the watersheds shown in Table 3-8 is provided below.

The Hashuqua Creek watershed contains forested wetlands W001-W010, W013, and W034R within the proposed new ROW corridor. Of an estimated total 15,035 forested wetland acres, the proposed ROW corridor through this watershed contains 4.86 acres, or less than 0.03 percent. W001 consists of 0.64 acre within the project area and is

connected to a tributary of Blackwater Creek. Portions of this wetland are inundated due to beaver activity. Dominant species observed include black willow, red maple, button bush, Chinese privet, and sedges. Based on the characteristics of this wetland and TVARAM score, this wetland complex likely provides moderate wetland function. W002-W010 and W013 are either connected to Wolf Creek via an offsite channel or occur within the floodplain of Wolf Creek. Common vegetation observed include water oak, sweetgum, American elm, black willow, and red maple. Saturated conditions within these areas resulted in soil profile coloration that is gray and mottled. These wetlands tended to vary in size and wetland quality scores were moderate (Appendix E). Wetland hydrology indicators, such as drainage patterns, crayfish burrows, and geomorphic position were exhibited within these forested wetlands. These hydrology parameters influenced the soil profile, and hydric soil coloration was evident. Hydrophytic forested vegetation was dominated by water oak, red maple, sweetgum, and/or black willow (Appendix E - USACE).

Table 3-8. Acreage of Low, Moderate, and Exceptional Resource Value Forested Wetlands by Watershed Within the Proposed Project Area

Watershed (10-HUC)	NWI Estimated Forested Wetland Acres in Watershed	Delineated Forested Wetland Acreage In Proposed Project Area			
		Low Value	Moderate Value	Exceptional Resource Value	TOTAL
Hashuqua Creek (0316010804)	15,035	0.00	4.86	0.00	**4.86**
Horse Hunters Creek-Noxubee River (0316010805)	7,568	0.00	16.33	0.00	**16.33**
Shuqualak Creek-Noxubee River (0316010807)	11,410	0.23	18.03	0.00	**18.26**
Running Water Creek-Macedonia Creek (0316010806)	5,691	2.55	0.75	0.00	**3.30**
Wahalak Creek (0316010808)	4,610	0.36	8.87	0.00	**9.23**
Bodka Creek (0316010810)	19,400	5.93	12.58	0.00	**18.51**
Running Tiger Creek-Sucarnoochie River (0316020201)	11,600	0.00	**0.00**	0.00	**0.00**
TOTAL	**75,314**	**9.07**	**61.42**	**0.00**	**70.49**

The Horse Hunters Creek-Noxubee River watershed contains forested wetlands W016, W017, W019, W020, and W021 within the proposed ROW corridor. Of an estimated 7,568 total forested wetland acres, the proposed ROW corridor through this watershed contains 16.33 acres, or approximately 0.22 percent. These wetland areas are mostly forested wetlands located within the 100-year floodplain of the Noxubee River. Portions of this large wetland system are disturbed and there is a food plot located in W019. Dominant species within these floodplain forested wetlands varies depending on the microtopography, but include green ash, black willow, American elm, sweetgum, loblolly pine, water oak, willow oak, and/or American sycamore. Based on the characteristics of these wetlands and TVARAM scores, these wetlands provide moderate wetland function.

The Shuqualak Creek-Noxubee River watershed contains forested wetlands W023 to W027, W040, and W042 to W043. Of an estimated 11,410 total forested wetland acres, the proposed ROW corridor through this watershed contains 18.26 acres, or approximately 0.16 percent. Forested wetlands mostly occur within the floodplain of Noxubee River and Shuqualak Creek. Dominant vegetation observed within forested wetlands include water oak, cherrybark oak, sweetgum, swamp tupelo, American elm, green ash, willow oak, Chinese privet, and inland sea oats. Sections of W026 appeared to have been clearcut in the past and are now dominated by sapling sweetgum and red maple. Most wetland areas exhibited similar hydrologic characteristics including saturation and geomorphic position. These saturated conditions left the soils with a gray coloration and the presence of mottling. Based on the wetland size, characteristics and TVARAM scores observed on site, wetlands provide low to moderate quality function.

The Running Water Creek-Macedonia Creek watershed contains forested wetlands W028, W031a, W032a, W033a, W034a, and W035. Of an estimated 5,691 total forested wetland acres, the proposed ROW corridor through this watershed contains 3.30 acres or less than 0.06 percent. These forested wetlands are located within the 100-year floodplain between Dry Creek and Macedonia Creek. Dominant vegetation includes sweetgum, red maple, American elm, and Chinese privet. Hydrology indicators observed within the wetland boundary included saturation, water-stained leaves, and geomorphic position. Consistent saturation created a soil profile and coloration that is gray and mottled.

The Wahalak Creek watershed contains forested wetlands W045 to W047 within the proposed ROW corridor. Of an estimated 4,610 total forested wetland acres, the proposed ROW corridor through this watershed contains 9.23 acres, or approximately 0.14 percent. Forested wetlands within this watershed contained green ash, Chinese privet, southern wax myrtle, sweetgum, loblolly pine, red maple, pignut hickory, and winged elm. Soils contained depleted matrix with mottles, indicative of hydric conditions. Drift deposits, water-stained leaves, and crayfish burrows were observed within W047, which is located on the floodplain of Wahalak Creek. Based on TVARAM scores, the majority of forested wetlands within the project area provide moderate wetland function.

The Bodka Creek watershed contained forested wetlands W048 to W057, W058b, W059a, and W060 within the proposed ROW corridor. Of an estimated 19,400 total forested wetland acres, the proposed ROW corridor through this water shed contains 18.51 acres, or approximately 0.07 percent. These wetlands are located along the Highway 45 ROW. These forested wetlands exhibited water-stained leaves, soils with depleted matrix and mottles, crayfish burrows, and surface cracks indicating wetland hydrology. Dominant vegetation included loblolly pine, green ash, American elm, slippery elm, shagbark hickory, willow oak, overcup oak, pignut hickory, sweetgum, red maple, poison ivy, and trumpet creeper. Based on characteristics of this wetland and the TRAM score, these wetlands likely provide low to moderate wetland function. With the exception of W060, none of the Bodka Creek watershed wetlands are located within a mapped floodplain.

The Running Tiger Creek-Sucarnoochie River watershed did not contain any forested wetlands within the proposed ROW corridor.

3.8.2. Environmental Consequences

Activities in wetlands are regulated by state and federal agencies to ensure no net loss of wetland resources. Under CWA §404, activities resulting in the discharge of dredge or fill material to waters of the U. S., including wetlands, must be authorized by the USACE

through a Nationwide, Regional, or Individual Permit to ensure no more than minimal impacts to the aquatic environment. The proposed project is located within the Mobile District USACE. CWA §401 mandates state water quality certification for projects requiring USACE approval. In Mississippi, the Department of Environmental Quality (MDEQ) certifies CWA Section 404 permits are compliant with state water quality regulations. Mississippi's jurisdiction would apply to regulated activities affecting jurisdictional wetlands within the project area. Lastly, EO 11990 (Protection of Wetlands) requires federal agencies to minimize wetland destruction, loss, or degradation, avoid new construction in wetlands wherever there is a practicable alternative, while carrying out agency responsibilities.

Efforts were made during project planning and siting to avoid wetlands to the extent practicable. However, because of project and topographic constraints, and because of the goal of minimizing impacts to other resources, no practicable alternative was available that would allow complete avoidance of wetlands. The process for detecting and avoiding wetland resources identified during the office level review, prior to field surveys, is described in Section 2.2.

3.8.2.1. Alternative A – No Action

Under the No Action Alternative, the proposed project would not proceed. As such, no project related disturbance to wetlands within the proposed project area would occur. Therefore, no impacts to wetlands in the project area would occur as a result of TVA actions associated with the proposed project.

3.8.2.2. Alternative B – Action Alternative

Under the Action Alternative, the proposed transmission lines and associated access roads would be constructed. As described in Section 2.2, adequate clearance between tall vegetation and transmission line conductors would require trees within the proposed ROWs to be cleared. Establishing the two proposed transmission line corridors would require vegetation clearing within the full extent of the ROWs and future maintenance of low stature vegetation (emergent or shrub-scrub habitat) to accommodate clearance and abate interference with overhead wires.

The proposed project area contains a total of 101.59 acres of wetlands with 25.41 acres of emergent wetland, 5.69 acres of scrub-shrub wetlands and 70.49 acres of forested wetland (Table 3-5). Emergent wetlands located on the proposed new ROW corridors would experience temporary impacts to accommodate access during construction. These wetlands would be maintained long term in their current state and functional capacity, due to their existing height being compatible and consistent with transmission line ROW vegetation management objectives. All of the 70.49 acres of forested wetlands and 5.69 acres of scrub-shrub wetlands would be permanently altered by the proposed project activities (Appendix E).

The proposed transmission line corridors are sited along a combination of existing, vacant, and new ROW; the majority (approximately 67 percent) of wetlands within the two corridors are forested as indicated in Table 3-5; scrub-shrub wetlands make up approximately 6 percent and emergent wetlands make up approximately 27 percent of the total wetlands within the proposed project area. While all wetlands within the ROWs would be spanned by the proposed transmission lines, initially any forested or shrub wetlands within the proposed transmission line corridors would be converted to mostly emergent wetlands.

Wooded wetland conversion to emergent habitat typically results in a reduction in wetland function. Due to the rate of water uptake, extensive root system, and structural integrity of trees and shrubs relative to herbaceous plants, wooded wetlands function at a greater capacity to impede and hold storm water, absorb toxins, retain sediment, and provide the shaded forage and spawning habitat necessary for its aquatic and terrestrial inhabitants to exist. Therefore, conversion of this community type to a habitat devoid of woody vegetation would result in a reduction of existing functional capacity.

Wetland fill associated with the proposed guy wire anchors, and structure placement results in total loss of wetland function within the impact area and is subject to USACE/MDEQ jurisdiction, per the directives of the CWA. Likewise, forested wetland conversion to accommodate structure locations and conductor spans is considered a secondary impact under CWA §404b. The proposed project requires wetland fill associated with structure placement, with the secondary impact of loss of wetland function due to the forested wetland clearing and conversion. Therefore, forested wetland loss is subject to the authority of the regulatory agencies to ensure no net loss of wetland functions and values, per the directive of the CWA and the federal no net loss of wetland policy (EPA 1990).

In compliance with the CWA and EO 11990 (Protection of Wetlands), TVA has considered options to avoid and minimize wetland impacts, resulting in the least wetland disturbance practicable. As discussed in Section 2.2, the presence of wetlands is one of the key considerations used in identifying and assessing potential alternative route locations when developing the project.

Wetland habitat located in areas proposed for heavy equipment travel could experience minor and temporary impacts during transmission line construction or long-term asset and vegetation management. TVA would minimize wetland disturbance through adherence to standard wetland best management practices for all work necessary within the delineated wetland boundaries (TVA 2022). This includes the use of low ground pressure vehicles, mats, or other wetland crossings to minimize rutting to less than 12 inches, erosion control techniques to deter indirect impacts through siltation into adjacent wetland area, dry season work, etc. Vehicular traffic would be limited to narrowed access corridors along the ROWs for structure and conductor placement, fiber installation, and long-term maintenance.

With wetland avoidance and wetland minimization techniques in place, TVA would comply with all USACE/MDEQ mitigation requirements to compensate for the proposed loss of wetland resources, functions, and values resulting from the proposed Action Alternative. TVA would obtain the necessary CWA §404/401 permits and required compensatory mitigation to ensure the proposed wetland impacts are compensated to the extent deemed appropriate such that wetland functions and values remain at the current capacity within larger affected basins. Required compensatory mitigation would be purchased through an approved wetland mitigation bank per the directive of the USACE and states to ensure no more than minimal impacts to the aquatic environment result and the objectives of the CWA are upheld.

Cumulative impact analysis of wetland effects considers wetland loss and habitat conversion at a watershed scale currently and within the reasonable and foreseeable future. Loss of wetland habitat due to wetland fill would be compensated through wetland mitigation banking, resulting in no cumulative wetland impacts. Loss of wetland functions and values from forested wetland clearing would be compensated for at the discretion of the USACE engineer. Forested wetland conversion for this project would take place across

seven watersheds, within two larger sub-basins (Noxabee and Sucamoochie). Approximately 70.49 acres of proposed forested wetland clearing would occur across six (6) of these watersheds (Table 3-9).

Table 3-9. Percent Forested Wetland Loss or Conversion by Watershed Withing the Proposed Project Area

Sub-Basin (8-HUC) and Nested Watersheds (10-HUC)	Estimated[1] Percent of Wooded Wetland Cover	Estimated[1] Percent of Wooded Wetland Conversion
Noxabee River (03160108)		
Hashuqua Creek (0316010804)	16.34	0.03
Horse Hunters Creek-Noxubee River (0316010805)	13.44	0.22
Shuqualak Creek-Noxubee River (0316010807)	13.15	0.16
Running Water Creek-Macedonia Creek (0316010806)	11.32	0.06
Wahalak Creek (0316010808)	10.28	0.14
Bodka Creek (0316010810)	14.46	0.07
Sucarnoochie River (03160202)		
Running Tiger Creek-Sucarnoochie River (0316020201)	12.62	0.00

[1]Source: National Wetland Inventory palustrine forested wetlands (USFWS 1982)

Studies have suggested that watersheds should contain 3 to 7 percent total wetland cover to provide adequate flood control and water quality values for the landscape (Mitsch and Gosselink 2000). This percentage does not distinguish between wetland habitat types. Regardless, the percentage of proposed forested wetland conversion would not appreciably reduce the estimated existing forested wetland extent within either sub-basin. In addition, forested wetland conversion does not constitute wetland loss. The functions and values associated with a forest's water storage, uptake, assimilation, filtration, and transpiration of storm water runoff would be provided at the reduced level facilitated by lower stature vegetation. Similarly, general trends in wetland impacts resulting from development within the watershed would be subject to CWA, USACE, and MDEQ mandates, and these regulatory requirements are in place to ensure wetland impacts do not cause cumulative loss.

Therefore, the proposed wetland impacts would be minimal on a cumulative scale due to the avoidance, minimization, and compliance measures in place. In compliance and accordance with the CWA and the directives of USACE and MDEQ ensuring no more than minimal adverse effects on the aquatic environment, the Action Alternative's impacts to wetlands would be insignificant

3.9. Aesthetics

3.9.1. Visual Resources

3.9.1.1. Affected Environment

This assessment provides a review and classification of the visual attributes of existing scenery, along with the anticipated attributes resulting from the proposed action. The classification criteria used in this analysis are adapted from a scenic management system developed by the U.S. Forest Service (USFS) and integrated with planning methods used by TVA (USFS 1995). Potential visual impacts to cultural and historic resources are not included in this analysis as they are assessed separately in Section 3.10 Archaeological and Historic Resources.

The visual landscape of an area is formed by physical, biological, and man-made features that combine to influence both landscape identifiability and uniqueness. The scenic value of a particular landscape is evaluated based on several factors that include scenic attractiveness, scenic integrity, and visibility. Scenic attractiveness is a measure of scenic quality based on human perceptions of intrinsic beauty as expressed in the forms, colors, textures, and visual composition of each landscape. Scenic attractiveness is expressed as one of the following three categories: distinctive, common, or minimal. Scenic integrity is a measure of scenic importance based on the degree of visual unity and wholeness of the natural landscape character. The scenic integrity of a site is classified as high, moderate, low, or very low. The subjective perceptions of a landscape's aesthetic quality and sense of place are dependent on where and how it is viewed.

Views of a landscape are described in terms of what is seen in the foreground, middleground, and background distances. In the foreground, defined as an area within 0.5 mile of the observer, details of objects are easily distinguished. In the middleground, from 0.5 mile to 4 miles from the observer, objects may be distinguishable, but their details are weak and tend to merge into larger patterns. Details and colors of objects in the background, the distant part of the landscape, are not normally discernable unless they are especially large and standing alone or have a substantial color contrast. In this assessment, the background is measured as 4 to 10 miles from the observer. Visual and aesthetic impacts associated with an action may occur because of the introduction of a feature that is not consistent with the existing viewshed. The impressions of an area's visual character can have a significant influence on how it is appreciated, protected, and used. Consequently, the visual character of an existing site is an important factor in evaluating potential impacts.

For the purposes of this visual assessment, the project area as described under the proposed Action Alternative is defined as the area encompassing the two transmission lines; Midway-S. Macon and S. Macon-Scooba-DeKalb located within Kemper, Noxubee and Kemper counties, in the Starkville and eastern Mississippi areas.

The proposed Midway-S. Macon Transmission Line would traverse a rural landscape characterized by irregular plains and smooth lowland plains, dominated by pastureland, forested uplands and bottomlands, pine plantations, and agricultural fields. The S. Macon-Scooba-DeKalb Transmission Line would traverse through smooth lowland plains and irregular plains as well as rolling topography. The landscape is dominated by rural lands (agricultural fields and pastures and pockets of dense forest) with areas of moderate development including commercial and residential development, roadways, and existing

utility corridors. Thus, the project vicinity consists of a combination of natural elements, such as rolling fields and forested areas, with human development, such as commercial and residential development and transportation corridors.

The composition and patterns of vegetation are the prominent natural features of the landscape within the project area. Pasture, bottomland and upland hardwood forests, pine plantations, and scattered residential, commercial, and industrial development occur in the project area. The forms, colors, and textures of the natural features of the project area are typical of eastern Mississippi and are not considered to have distinctive visual quality. Therefore, scenic attractiveness of the project area is considered common, due to the ordinary or common visual quality in the foreground, middleground, and background (Table 3-10). The scenic integrity is considered moderate due to noticeable human alteration, including commercial, residential, agricultural, and transportation uses. The scenic value class of a landscape is determined by combining the levels of scenic attractiveness, scenic integrity, and visibility and can be excellent, good, fair, or poor. Based on the criteria used for this analysis, the overall scenic value class for the project area is good.

Table 3-10. Visual Assessment Ratings for Project Area

	Existing Landscape	
View Distance	**Scenic Attractiveness**	**Scenic Integrity**
Foreground	Common	Moderate
Middleground	Common	Moderate
Background	Common	Moderate

In a visual impact assessment, sensitive receptors generally include any scenic vistas, scenic highways, residential viewers, and public facilities or recreational areas located in the project's viewshed. The proposed transmission lines would be visible to passing motorists from US-45, MS-16, MS-14, and various local roads along the transmission line routes. Other sensitive visual receptors in the foreground include scattered residences and farmsteads. In addition, there are a number of churches, cemeteries, schools, parks, community areas (camps and community centers), and natural areas within the viewshed of the proposed transmission lines (see Figure 3-1). The majority of these facilities occur within the middleground of the project area, at a distance between 0.5 and 4 miles. There are ten churches, four cemeteries, six schools, and a community area located within the foreground of the proposed project area. In addition, the Noxubee River, Wahalak Creek Hills, and Noxubee River at Shuqualak Natural Areas are located within the foreground of the project area. The closest of these is the Noxubee River at Shuqualak Natural Area which is crossed by the proposed transmission line.

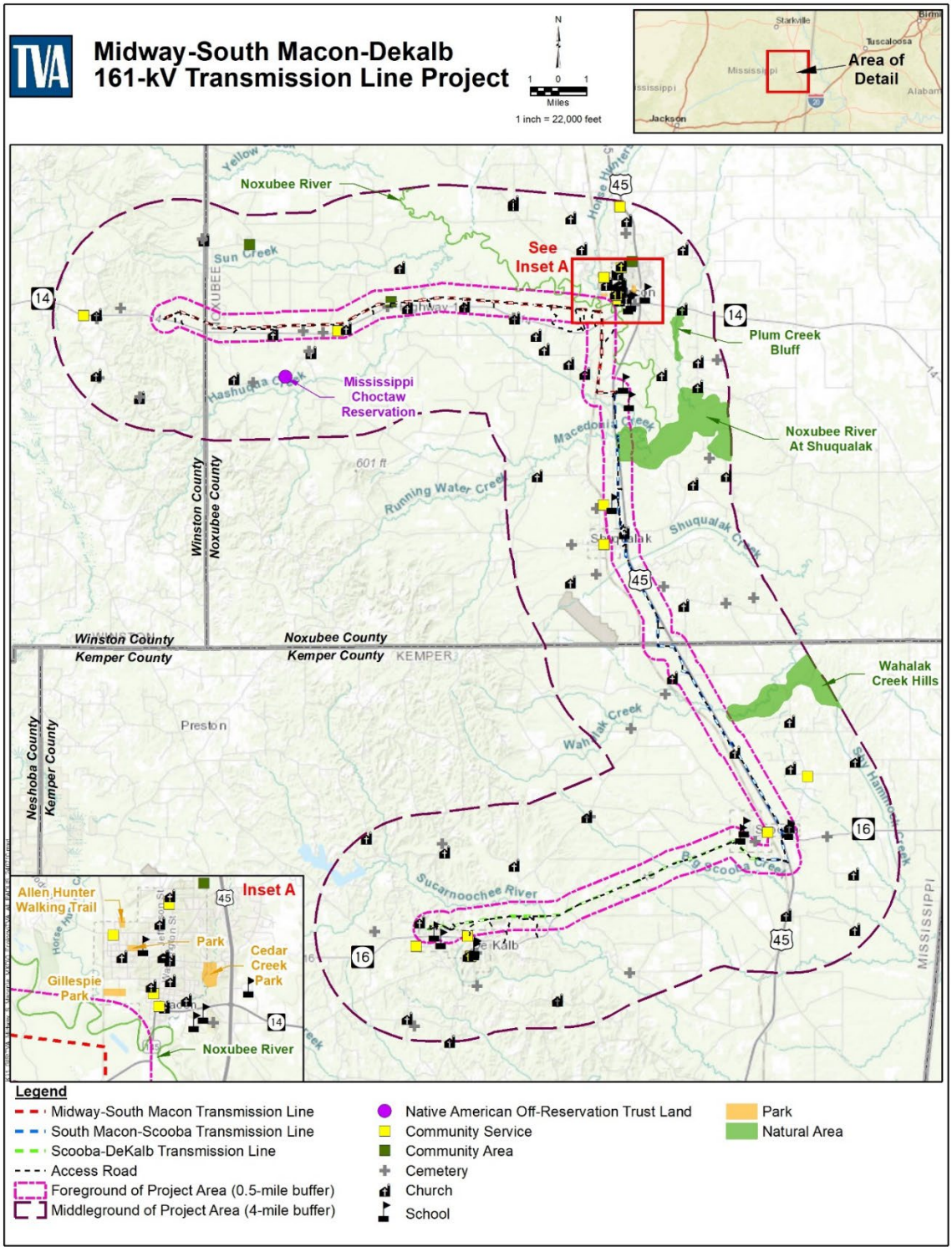

Figure 3-1. Sensitive Visual Receptors Within the Foreground and Middleground of the Proposed Midway-South Macon-DeKalb 161-kV Transmission Lines

3.9.1.2. Environmental Consequences

The potential impacts to the visual environment from a given action are assessed by evaluating the potential for changes in the scenic value class ratings based upon landscape scenic attractiveness, integrity, and visibility. Sensitivity of viewing points available to the general public, their viewing distances, and visibility of the proposed action are also considered during the analysis. These measures help identify changes in visual character based on commonly held perceptions of landscape beauty and the aesthetic sense of place. The extent and magnitude of visual changes that could result from the proposed alternatives were evaluated based on the process and criteria outlined in the scenic management system as part of the environmental review required under NEPA.

3.9.1.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not acquire new ROW to construct the new transmission lines, expand existing ROW, or construct new access roads. Thus, landscape character and integrity would remain in its current state and there would be no impacts to visual resources as a result of TVA actions associated with the proposed project. However, changes to visual resources are anticipated to continue to occur from the cumulative effects of surrounding land use development.

3.9.1.2.2. Alternative B – Action Alternative

Under the Action Alternative, construction of the proposed transmission lines would result in both short-term and long-term impacts to visual resources. During the construction period (approximately 13 months), there would be some visual discord from existing conditions due to an increase in personnel and equipment coupled with disturbances of the current site characteristics. However, this would be contained within the immediate vicinity of the construction activities and would only last until all project activities have been completed and the disturbed areas have been seeded and restored through the use of TVA's standard BMPs (TVA 2022). Because of their temporary nature, construction-related impacts to local visual resources are expected to be minor. In addition, there may be some visual discord associated with permanent access roads required for construction and maintenance activities. Where possible, these access roads would utilize existing roadways and existing utility ROWs. However, new access roads would be established to support the construction and maintenance of the transmission lines. Sensitive visual receptors located along the access roads would experience some minor visual discord during construction and maintenance activities. These impacts would be greater in areas with new access roads, compared to access established on existing roads and utility ROWs. Access roads would mainly be utilized during the short-term construction period and then periodically utilized for transmission line and ROW maintenance activities. Given the rural but residential development of the area, construction and utilization of the access roads would have a minor impact on sensitive receptors and scenic quality.

Long-term impacts consist of the visible alterations associated with new transmission structures, overhead wires, ROW clearing, and access road maintenance and use. The most visible elements of the electric transmission system are the transmission structures (with a maximum height of 106 feet above ground) and the permanent removal of woody vegetation within the new ROW that creates a visible corridor. However, the addition of lines on or near existing structures or within existing ROWs increases compatibility with the landscape and minimizes visual impacts. Therefore, on the approximately 13.5-mile section of the Midway-S. Macon Transmission Line and the approximately 17.9-mile section of the S. Macon-Scooba-DeKalb Transmission Line where the proposed project would parallel existing highway or ROW, changes to the viewshed would be minimized, as the

project would slightly expand the existing corridor feature rather than create a new visible corridor. Within the remaining 5.9 miles of the Midway-S. Macon Transmission Line and 14.9 miles of the S. Macon-Scooba-DeKalb Transmission Line the removal of forested areas and the installation of primarily two-pole steel structures and overhead wires within the new ROW would add discordantly contrasting elements and colors to the environment. Although much of the proposed transmission lines would not be visible to the public due to the distance from developed areas and presence of forested buffers, they would be visible in the foreground to motorists on nearby roadways, a number of residences, and observers in natural areas.

Observers and recreators of the Noxubee River would be impacted by the visual intrusion of the proposed Midway-S. Macon Transmission Line as the project would utilize new 100-foot ROW. Observers and recreators of the Noxubee River at Shuqualak and of the Wahalak Creek Hills would have minimal impacts from the visual intrusion of the S.-Macon-Scooba Transmission Line, as existing highways and transmission line ROW are present adjacent to the proposed ROWs. The proposed construction of the new transmission lines would be noticeable but would not significantly alter the recreational use of the area or views for observers in the vicinity.

As noted above, several residents reside in close proximity to the proposed transmission line ROWs. Areas where new ROW is being proposed would create a new visible corridor and would be visible in the foreground to a number of these residences and to motorists. Although tree and woody vegetation removal would occur along some of the new ROW, much of the proposed transmission lines would be located in previously disturbed areas and located near major roadways and existing commercial development. As a majority of the proposed ROW is adjacent to existing transmission line ROW and transportation development, the introduction of the proposed transmission lines would be minor. While the proposed transmission lines would add discordant visual elements to the existing landscape, the transmission lines are anticipated to be somewhat absorbed into the overall landscape character near existing utility corridors and roadways.

In addition to nearby residents and motorists, other sensitive visual receptors in the foreground include ten churches, six schools, four cemeteries, and a community center. Furthermore, Noxubee River, Noxubee River at Shaqualak, and Wahalak Creek Hills Natural Areas are also located within the foreground of the proposed project area (Figure 3-1). The Noxubee River at Shaqualak Natural Area is the closest sensitive visual receptor and would be intersected by the proposed S. Macon-Scooba Transmission Line segment. The first 5.5 miles of the S. Macon-Scooba Transmission line is located on existing 75-foot-wide ROW which would be extended to 100-feet wide. As such, visual impacts from the construction of this transmission line on the Noxubee River at Shaqualak Natural Area would be minimal as it would be located in an existing ROW and near US-45. While some new ROW would be cleared for the proposed transmission lines, a majority of the Midway-S. Macon-DeKalb Transmission Line is located with existing ROW. As such, the presence of an existing transmission line ROW and major roadways including US-45, MS-14, and MS-16, increases visual compatibility for the construction of the proposed Midway-S. Macon-DeKalb Transmission Line and prevents significant changes to the viewshed. Additionally, a majority of the sensitive receptors within the foreground of the project area are shielded from view by dense vegetation and/or topography. For visual receptors located at further distances, in the middleground and background, the proposed transmission lines would be less visible and obtrusive as it would largely fall into an observer’s view where objects are less distinguishable.

The human alterations already in place within the project area, including commercial development, roadways, and existing transmission system elements, currently contribute some visual discord with the natural landscape. These elements contribute to the landscape's ability to absorb negative visual change. Therefore, while the visual forms, colors, and textures of the landscape that make up the scenic attractiveness would be affected by the construction of the transmission lines, it would still remain common or ordinary (Table 3-11). Impacts to scenic integrity are anticipated to be greatest in the foreground along the proposed transmission lines. At this distance, scenic integrity would be reduced from moderate to low, as visual alterations associated with the proposed transmission lines (transmission structures, lines, and clear-cut ROW corridors that disrupt the tree canopy) would be dominant features on the landscape. However, there would be no change in the ratings for the middleground and background as the alterations associated with the transmission lines would not be substantive enough to dominate the view from these distances (Table 3-11). Based on the criteria used for this analysis, the scenic value class for the affected environment after the proposed modifications would be reduced to fair in the foreground along the length of the proposed transmission lines but would remain classified as good in the middleground. While the proposed Action Alternative would contribute to a minor decrease in visual integrity of the landscape, the existing scenic class would not be reduced by two or more levels, which is the threshold of significance of impact to the visual environment. Therefore, visual impacts resulting from the implementation of the Action Alternative would be minor.

Table 3-11. Visual Assessment Ratings for Project Area Resulting From Action Alternative

	Resulting Landscape	
View Distance	**Scenic Attractiveness**	**Scenic Integrity**
Foreground	Common	Low
Middleground	Common	Moderate
Background	Common	Moderate

3.9.2. Noise

3.9.2.1. Affected Environment

Noise is unwanted or unwelcome sound usually caused by human activity and added to the natural acoustic setting of a locale. It is further defined as sound that disrupts normal activities or that diminishes the quality of the environment. Community response to noise is dependent on the intensity of the sound source, its duration, the proximity of noise-sensitive land uses, and the time of day the noise occurs (i.e., higher sensitivities would be expected during the quieter overnight periods).

Sound is measured in logarithmic units called decibels (dB). Given that the human ear cannot perceive all pitches or frequencies of sound, noise measurements are typically weighted to correspond to the limits of human hearing. This adjusted unit of measure is known as the A-weighted decibel (dBA) which filters out sound in frequencies above and below human hearing. A noise level change of 3 dBA or less is barely perceptible to average human hearing. However, a 5 dBA change in noise level is clearly noticeable. The noise level associated with a 10 dBA change is perceived as being twice as loud;

whereas the noise level associated with a 20 dBA change is four times as loud and would therefore represent a “dramatic change” in loudness.

To account for sound fluctuations, environmental noise is commonly described in terms of the equivalent sound level. The equivalent sound level is the constant noise level that conveys the same noise energy as the actual varying instantaneous sounds over a given period. Fluctuating levels of continuous, background, and/or intermittent noise heard over a specific period are averaged as if they had been a steady sound. The day-night sound level (L_{dn}), expressed in dBA, is the 24-hour average noise level with a 10-dBA correction penalty for the hours between 10 p.m. and 7 a.m. to account for the increased sensitivity of people to noises that occur at night. Typical background day-night noise levels for rural areas are anticipated to range between an L_{dn} of 35 and 50 dB, whereas higher-density residential and urban areas background noise levels range from 43 dB to 72 dB (EPA 1974). Common indoor and outdoor noise levels are listed in Table 3-12.

Table 3-12. Common Indoor and Outdoor Noise Levels

Common Outdoor Noises	Sound Pressure Levels (dB)	Common Indoor Noises
	110	Rock Band at 5 m (16.4 ft)
Jet Flyover at 300 m (984.3 ft)		
	100	Inside Subway Train (New York)
Gas Lawn Mower at 1 m (3.3 ft)		
	90	Food Blender at 1 m (3.3 ft)
Diesel Truck at 15 m (49.2 ft)		Garbage Disposal at 1 m (3.3 ft)
	80	Shouting at 1 m (3.3 ft)
Gas Lawn Mower at 30 m (98.4 ft)	70	Vacuum Cleaner at 3 m (9.8 ft)
Commercial Area		Normal Speech at 1 m (3.3 ft)
	60	Large Business Office
	50	Dishwasher Next Room
Quiet Urban Daytime		
	40	Small Theater, Large Conference Room
Quiet Urban Nighttime		Library
Quiet Suburban Nighttime		
	30	Bedroom at Night
Quiet Rural Nighttime		Concert Hall (Background)
	20	Broadcast and Recording Studio
	10	
		Threshold of Hearing
	0	

Source: Federal Highway Administration (FHWA), 2018

There are no federal, state, or locally established quantitative noise-level regulations specifying environmental noise limits for the proposed transmission lines or the surrounding area. However, the EPA noise guideline recommends outdoor noise levels do not exceed Ldn of 55 dBA, which is sufficient to protect the public from the effect of broadband environmental noise in typical outdoor and residential areas. These levels are not regulatory goals but are "intentionally conservative to protect the most sensitive portion of the American population" with "an additional margin of safety" (EPA 1974). The U.S. Department of Housing and Urban Development (HUD) considers an Ldn of 65 dBA or less to be compatible with residential areas (HUD 1985).

3.9.2.2. Environmental Consequences

3.9.2.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not acquire new ROW to construct the new transmission lines, expand existing ROW, or construct new access roads. Therefore, no impacts to noise would occur as a result of TVA actions associated with the proposed project.

3.9.2.2.2. Alternative B – Action Alternative

Under the Action Alternative, construction activities of the proposed Midway-S. Macon-Dekalb Transmission Lines would last approximately 13 months and would generally be limited to daytime hours. During construction, noise would be generated by a variety of equipment including standard pick-up trucks, dump trucks, concrete trucks, feller-bunchers, bulldozers, excavators, graders, pile-drivers, augers, and rollers. Typical noise levels are expected to be 85 dBA or less at 50 feet from the construction equipment, except for pile-drivers which may produce noise levels of up to 95 dBA at 50 feet (Federal Highway Administration [FHWA] 2016). The actual observed noise would likely be lower in the field where vegetation and topography would cause further noise attenuation. Thus, typical construction noise would fall below the recommended EPA outdoor noise guideline of 55 dBA at all sensitive receptors. Additionally, pile driver use would be a short-term and relatively infrequent occurrence that would not contribute to typical background noise levels.

There is also a potential for indirect noise impacts associated with a temporary increase in traffic related to the workforce vehicle traffic, transport of construction equipment, and transport of spoil and borrow material. Roadway traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (FHWA 2011).

Due to the nature of the decibel scale and the attenuating effects of noise with distance, a doubling of traffic volume would result in an approximately 3 dBA increase in noise level, which would not normally be a perceptible noise increase (FHWA 2011).

During construction, operation, and maintenance of the proposed transmission lines, equipment could generate noise above ambient levels (Appendix F). As all construction noise would be temporary in nature and limited to daytime hours, noise impacts from construction of the proposed transmission lines would be minor.

Operational Noise

For similar reasons, noise related to periodic line maintenance is also expected to be insignificant. Transmission lines may produce minor noise during operation under certain atmospheric conditions.

Under certain wet weather conditions, high-voltage transmission lines may produce an audible low-volume hissing or crackling noise from corona discharge (the electrical breakdown of air into charged particles). Corona noise is composed of both broadband noise, characterized as a crackling noise, and pure tones, characterized as a humming noise. Under normal conditions, corona-generated noise is not audible, and during rain showers, the corona noise would likely not be readily distinguishable from background noise. During very moist, non-rainy conditions, such as heavy fog, the resulting corona noise may produce a very minor increase in background noise levels, but due to distance, it is not expected to result in perceptible changes in noise level at the closest sensitive receptors. Off of the ROW, corona noise is below the level that would interfere with speech.

3.10. Archaeological and Historic Resources

3.10.1. Affected Environment

Cultural resources include precontact and historic archaeological sites, districts, buildings, structures, and objects as well as locations of important historic events. Federal agencies, including TVA, are required by the National Historic Preservation Act (NHPA) (54 USC 300101 et seq) and by NEPA to consider the possible effects of any of their projects, activities, and programs (including licenses, permits, or other assistance) on historic properties. Federal agencies may fulfill their statutory obligations under NEPA regarding cultural resources by following the process outlined in the regulations implementing Section 106 of NHPA at 36 CFR Part 800 and coordinating the process with the NEPA process.

Section 106 of the NHPA requires that federal agencies consider the potential effects of their actions on historic properties and allow the Advisory Council on Historic Preservation an opportunity to comment on the action. The Section 106 process includes identifying consulting parties, determining an area of potential effects (APE), identifying historic properties in the APE, assess the undertaking's potential adverse effects on historic properties, and resolving any adverse effects. This process is carried out in consultation with the State Historic Preservation Officer (SHPO) of the state in which the undertaking takes place and other interested consulting parties, including federally recognized Indian tribes with an interest in the project area.

Cultural resources are considered historic properties if they are listed or eligible for listing in the National Register of Historic Places (NRHP), which is maintained by the National Park Service. The NRHP eligibility of a resource is based on the Secretary of the Interior's criteria for evaluation (36 CFR 60.4), which state that significant cultural resources possess historic significance or research value, and also display integrity of location, design, setting, materials, workmanship, feeling, and association such that they are able to convey their historic significance.

To be eligible for listing on the NRHP if the cultural resource meets one of the following criteria:

- Criterion A: made a significant contribution to American history; for example, literature, ethnic heritage, health/medicine, and transportation.
- Criterion B: related to the life of significant persons; examples of NRHP properties nominated under Criterion B include George Washington's Mt. Vernon estate.
- Criterion C: embodied distinctive characteristics of a type, period, or method of construction including works of a master or buildings that possess high artistic value.
- Criterion D: yielded important information about history or prehistory. This category is typically the most relevant criterion for archaeological resources. "Undertaking" means any project, activity, or program that has the potential to have an effect on a historic property and that is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency.

During the Section 106 process, the agency must consult with the appropriate SHPO, federally recognized Indian tribes that have an interest in the undertaking, and any other party with a vested interest in the undertaking. If avoidance or minimization are not feasible, measures to mitigate the adverse effect must be taken.

The APE is the geographic area or areas within which an undertaking may (directly or indirectly) cause changes in the character or use of historic properties, if such properties exist. If any historic properties are present in the APE the agency must assess whether the undertaking would result in any adverse effects on a historic property, in consultation with the SHPOs and tribes. Examples of adverse effects would be ground disturbing activity in an archaeological site or erecting structures within the viewshed of a historic building in such a way as to diminish the structure's integrity of feeling or setting. Agencies must seek ways to resolve any adverse effects through avoidance, minimization, or mitigation.

The APE for the proposed action includes areas where transmission structures would be installed (where footprint-based impacts to resources could occur), as well as all areas within a 0.5-mile radius of those locations where visual effects could occur. TVA recommends that the APE for the current undertaking includes the following:

- The approximately 52.2 miles of 100-foot-wide planned ROW occupying about 631.0 acres and unpaved access routes for construction.
- All areas in which the project would be visible within a 0.5-mile radius of the proposed transmission line.

3.10.1.1. Archaeological Resource Surveys

TVA completed cultural resources surveys of the APE in three stages. The initial surveys included an archaeological survey of the proposed 100-foot-wide ROW and associated unpaved access routes for the 19.4-mile section from S. Macon-Scooba, and a survey for historic architectural properties within a 0.5-mile radius of the proposed centerline. This survey (Manning et al. 2023) was completed between January 30, 2023, and March 21, 2023, and identified seven archaeological sites, five linear resources, and 16 above-ground historic architectural properties. The second survey (Manning et al. 2024a) included archaeological survey of the proposed ROW for the 19.8-mile section from S. Macon-

Scooba plus historic architectural survey of the viewshed within a 0.5-mile radius. This survey was completed between August 14, 2023, and October 5, 2023, and identified 18 archaeological sites and 30 additional above-ground historic architectural resources. TVA has consulted with the Mississippi SHPO and federally recognized Indian tribes regarding the surveys' findings and NRHP eligibility determinations.

The third stage of survey (Manning et al. 2024b) included archaeological survey of the proposed ROW for the 14-mile section from Scooba-DeKalb and associated unpaved access routes, as well as the unpaved access routes for the S. Macon-Scooba section. It also included a historic architectural survey for areas within a 0.5-mile radius of the Scooba-DeKalb section. This survey identified nine archaeological sites and 12 additional architectural resources (not counting three linear resources that were also identified in the previous survey and overlapped survey boundaries). In all, these surveys recorded a total of 34 archaeological sites and 53 historic architectural properties (including several linear resources). The linear resources consisted of an abandoned TVA transmission line, an abandoned railroad spur, and sections of four abandoned roads. TVA is consulting with the Mississippi SHPO and federally recognized Indian tribes regarding the survey results and NRHP eligibility determinations.

3.10.1.2. Archaeological Sites

TVA determined, based on the survey results, that the majority of the identified archaeological sites either are ineligible for inclusion in the NRHP, or are only partially within the project footprint (ROW) and that the portions within the footprint lack research potential (significance or integrity). Exceptions to this consist of sites that either are eligible for inclusion in the NRHP (22KE501), or potentially eligible (22NO626, 22NO634, 2KE1010, 22KE1011, 22KE1012, and 22KE1016). TVA is treating all seven of these sites as historic properties for purposes of complying with Section 106 of the NHPA. To date the Mississippi SHPO has concurred with TVA's findings and none of the consulted tribes have objected or identified additional resources of concern in the APE. Mississippi SHPO concurrence and tribal comments for the Scooba-DeKalb section are pending the completion of TVA's consultation.

3.10.1.3. Architectural Resources

TVA determined that one of the linear resources (KE0001, a portion of the historic Jackson Highway) is eligible for the NRHP, and the remaining linear resources are ineligible. TVA determined further that all of the above-ground historic architectural properties identified in the surveys are ineligible for inclusion in the NRHP due to either a lack of historic significance or a lack of sufficient integrity. Final Mississippi SHPO comments on these determinations are pending the completion of TVA's consultation. TVA is treating KE0001 as a historic property for purposes of complying with Section 106 of the NHPA.

3.10.2. Environmental Consequences

3.10.2.1. Alternative A – No Action

Under the No Action Alternative, existing land use would be expected to remain unchanged. Ground disturbing agricultural practices would continue to potentially impact intact cultural resources at the surface or within the first 8 to 10 inches of soil. However, no adverse effect to cultural resources would be anticipated from TVA actions.

3.10.2.2. Alternative B – Action Alternative

Under the proposed Action Alternative, TVA would acquire new ROW and build approximately 52.2 miles of transmission line. Actions within the proposed new ROW would include removing trees and other vegetation, installing transmission structures and guy wires, and the use of associated access roads, some of which may require minor improvements. These actions have potential for physical effects on the six identified archaeological sites that are either eligible or potentially eligible for the NRHP and the linear historic architectural resource that is eligible for the NRHP (KE0001, remnant of Jackson Highway).

Based on the actual project design the Action Alternative would avoid any adverse effects on linear architectural resource KE0001 (remnant of Jackson Highway).

TVA would install no transmission structures or guy wire anchors within the buffers of archaeological sites 22NO626, 22NO634, 22KE1010, 22KE1011, or 22KE1012. One structure would be placed within site 22KE1016. However, this structure would be installed in a portion of the site that lacks any sensitive cultural features and TVA and SHPO agreed this action would not adversely affect the site. TVA also would not install any transmission structures within site 22KE501. TVA would deploy wetland mats within the site buffers of all seven eligible or potentially eligible sites if construction vehicles must traverse the site, to avoid any ground disturbance. All vegetation clearing within the site buffers would be carried out either by hand or with light-duty or low ground pressure equipment, and stumps will be left in place. These measures would avoid any adverse effects to these archaeological sites.

Based on current design and with the above restrictions in place for construction, the proposed actions would not result in significant impacts on any historic properties. Should previously undiscovered cultural resources be identified during Project Site construction or operations, a TVA archaeologist and consulting parties will be consulted before any further action is taken. Therefore, TVA finds that the undertaking i.e., implementing the Action Alternative, would have no adverse effect to historic properties.

3.11. Recreation, Parks, and Managed Areas

3.11.1. Affected Environment

This section describes recreational opportunities and natural areas near the proposed transmission lines ROW. Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, USDA, USFS, State of Mississippi) to protect and maintain certain ecological and/or recreational features. Natural areas include ecologically significant sites; federal, state, or local park lands; national or state forests; wilderness areas; scenic areas; wildlife management areas; recreational areas; greenways; trails; Nationwide Rivers Inventory streams; and wild and scenic rivers. Ecologically significant sites are either tracts of privately owned land that are recognized by resource biologists as having significant environmental resources or identified tracts on TVA lands that are ecologically significant but not specifically managed by TVA's Natural Areas program.

There are no developed recreational areas or parks within the immediate vicinity of the proposed project area. A review of the TVA Regional Natural Heritage database identified five managed and natural areas within 3 miles of the proposed project area (Table 3-13).

The proposed transmission line route crosses a portion of the Noxubee River at Shaqualak Conservation Site (see Figure 3-1). This natural area contains various botanical and

aquatic element occurrence records. Wahalak Creek Hills is adjacent to a portion of the proposed transmission line and is a conservation site with numerous botanical element occurrence records. The Noxubee River, a National River Inventory (NRI) stream listed as having outstandingly remarkable values in cultural, fish, historic, recreational, scenic, and wildlife. Plum Creek Bluffs is a conservation site with botanical and terrestrial zoological element occurrence records.

Table 3-13. Managed and Natural Areas within 3 Miles of the Proposed Project Area

Natural Area	Acres	County	State	Distance from Project Area
Noxubee River at Shaqualak-Conservation Site	5,759.15	Noxubee	Miss.	Overlap/adjacent
Wahalak Creek Hills	5,716.45	Kemper	Miss.	Adjacent
Choctaw Indian Reservation	32,248.11	Multiple	Miss.	0.4 mile
Noxubee River (NRI)	332.79	Multiple	Miss.	1.0 mile
Plum Creek Bluff	241.97	Noxubee	Miss.	2.3 miles

Some informal recreational activities such as hunting, nature observation, hiking, and walking for pleasure may occur on some of the lands within or near the proposed transmission line corridors and project related access routes. Of note, cemeteries are often utilized as recreation resources in rural areas where access to parks, sidewalks, trails, etc. are inaccessible or nonexistent. Several cemeteries are less than 1 mile from the proposed project area (Table 3-14).

Table 3-14. Recreational Resources Within 3 Miles of the Proposed Project Area

Recreation Area	Distance from Project Area
Mt. Olive Cemetery	0.1 mile
United Methodist Church Cemetery	0.5 mile
Perkinsville Cemetery	1.6 miles
Ruff Cemetery	2.0 miles
Kirk Cemetery	2.5 miles

3.11.2. Environmental Consequences

3.11.2.1. Alternative A – No Action

Under the No Action Alternative, the proposed project would not be implemented and no direct, indirect, or cumulative impacts from TVA project-related actions on recreational areas or natural areas would be anticipated.

3.11.2.2. Alternative B – Action Alternative

Under the Action Alternative, construction of the proposed transmission lines could cause temporary disruption to recreational areas adjacent to or within a 0.5-mile radius of the proposed project area. Ground disturbance and clearing activities associated with construction would directly impact a portion of the Noxubee River at Shaqualak Conservation Site and would be adjacent to a portion of Wahalak Creek Hills. However,

these impacts would be temporary and minor to recreational activities. Further, none of the impacted areas contain botanical and aquatic element occurrence records so those resources would not be impacted. The area between the proposed ROW and the Noxubee River (NRI) contains forested riparian and after coordination with NPS with regard to this project, it was determined that no direct or significant impacts to this area are expected. No direct impacts to the remaining natural areas are expected, given their distance from the project area and the nature of the proposed project. Minor noise, transportation, and visual impacts could occur during construction. However, BMPs would be used, and TVA would coordinate with the land managers of the areas prior to any construction, for guidance to minimize these potential impacts. Overall, impacts would be temporary and minor. The remaining natural areas and cemeteries are a sufficient distance from the project area that no direct or major impacts are expected, given the nature of the proposed project.

3.12. Socioeconomics and Environmental Justice

3.12.1. Affected Environment

As detailed in Section 3.12.2.2, impacts associated with the proposed project consist of temporary disturbances during construction (i.e., noise, traffic, and fugitive dust) as well as long-term visual and property value impacts, all of which are limited to communities in the immediate vicinity of the project footprint. There would be no emissions or releases of air pollutants or hazardous materials that would impact human health or welfare in the surrounding area. Thus, the study area for the socioeconomic and environmental justice analysis is limited to the 12 census block groups located in a 1-mile radius of the centerline of the proposed transmission lines (see Figure 3-2). As the study area is located within Kemper, Noxubee, and Winston counties, these counties and the state of Mississippi are included as appropriate secondary geographic areas of reference. Comparisons at multiple spatial scales provide a more detailed characterization of populations that may be affected by the proposed actions, including any environmental justice populations (e.g., minority and low-income). Demographic and economic characteristics of populations within the study area were assessed using the most recent U.S. Census Bureau (USCB) data available, including 2020 Decennial Census counts (USCB 2020) for total population and racial characteristics, and 2018-2022 American Community Survey (ACS) 5-year estimates (USCB 2022) for the remaining datasets.

3.12.1.1. Demographic and Economic Conditions

Demographic and economic characteristics of the block groups that make up the study area and of the secondary reference geographies are summarized in Table 3-15. The proposed study area has a resident population of 13,068 and is characterized by low-density residential development. Since 2010, the study area population has declined by approximately 10 percent, which is generally consistent with the population decline in the surrounding counties which ranges from an approximately 8 percent decline in Winston County to an approximately 14 percent decline in Kemper County. During the same time period, the population of the State of Mississippi remained relatively unchanged, declining only 0.2 percent.

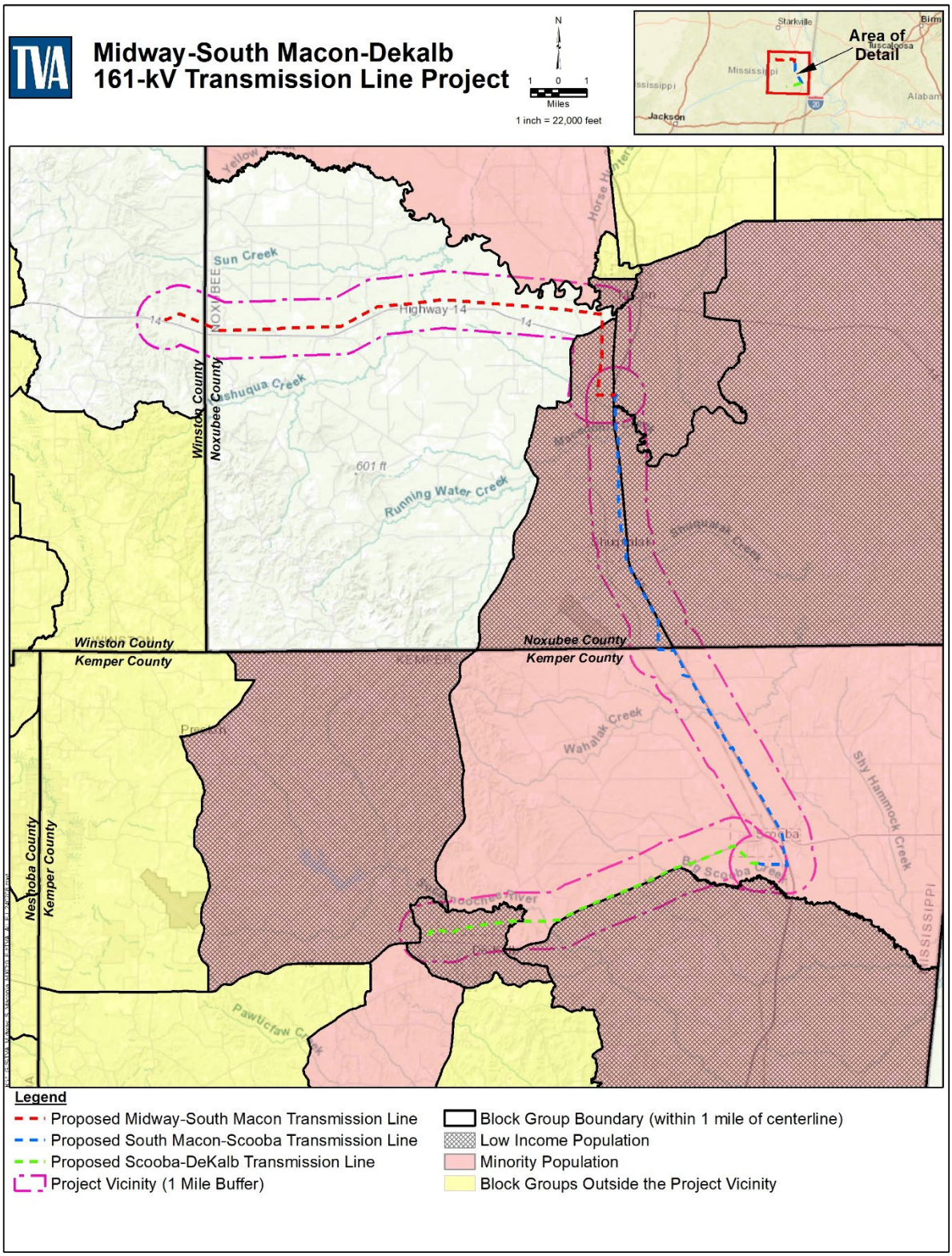

Figure 3-2. Environmental Justice Populations Within the Study Area

Table 3-15. Demographic and Socioeconomic Characteristics[1]

	Study Area (12 Census Block Groups within 1 mile of Proposed Transmission Lines)	Kemper County, Mississippi	Noxubee County, Mississippi	Winston County, Mississippi	State of Mississippi
Population[1,2,3]					
Population, 2020	13,068	8,988	10,285	17,714	2,961,279
Population, 2010	14,465	10,456	11,545	19,198	2,967,297
Percent Change 2010-2020	-9.7%	-14.0%	-10.9%	-7.7%	-0.2%
Persons under 18 years, 2022	23.6%	18.2%	24.8%	21.9%	23.4%
Persons 65 years and over, 2022	17.8%	20.6%	17.1%	21.3%	16.5%
Racial Characteristics[1]					
Not Hispanic or Latino					
White alone, 2020[(a)]	28.5%	31.3%	25.7%	50.0%	55.4%
Black or African American, 2020[(a)]	67.7%	61.0%	69.9%	45.6%	36.4%
American Indian and Alaska Native, 2020[(a)]	0.3%	5.1%	0.1%	0.9%	0.5%
Asian, 2020[(a)]	0.0%	0.1%	0.1%	0.2%	1.1%
Native Hawaiian and Other Pacific Islander, 2020[(a)]	0.0%	0.0%	0.0%	0.0%	0.0%
Some Other Race alone, 2020[(a)]	0.1%	0.1%	0.0%	0.1%	0.2%
Two or More Races, 2020	2.2%	1.6%	2.5%	1.9%	2.8%
Hispanic or Latino, 2020	1.1%	0.7%	1.7%	1.3%	3.6%
Income and Employment[3]					
Per capita income, 2022	$22,372	$22,046	$19,804	$27,743	$29,209
Persons below poverty level, 2022	25.1%	22.0%	23.2%	26.0%	19.2%
Persons below low-income threshold, 2022[(b)]	58.0%	52.0%	56.9%	47.3%	40.7%
Civilian Labor Force, 2022	4,972	3,825	4,275	7,033	1,331,419
Percent Employed, 2022	88.5%	85.9%	90.7%	93.1%	93.6%
Percent Unemployed, 2022	11.5%	14.1%	9.3%	6.9%	6.4%

[1] Source: 1. U.S. Census Bureau (USCB) 2011, 2. USCB 2020, 3. USCB ACS 2021(a) Includes persons reporting only one race; (b) Low-income threshold is defined as two times the poverty level

The majority of the population within the study area (approximately 68 percent) is Black or African American. Minorities in the study area (other than Black/African American) include: persons who identified as two or more races (2.2 percent), Hispanic or Latino (1.1 percent), small numbers who are American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, and persons who identify as some other race. Similar to minority population percentages in the study area (71.5 percent), minority populations in Kemper and Noxubee counties account for 68.7 percent and 74.3 percent of the population, respectively. Additionally, minority populations in Winston County comprise approximately 50 percent of the population. Minority population percentages in the study area, as well as Kemper and Noxubee counties are significantly greater than the state of Mississippi (44.6 percent).

The average per capita income within the study area is $22,372, which is higher than Noxubee County ($19,804), similar to Kemper County ($22,046), and lower than Winston County ($27,743). Average per capita income in the state of Mississippi ($29,209) is higher than both the study area and associated counties. The percentage of the study area population falling below the poverty level (approximately 25 percent) is slightly lower than Winston County (26 percent) but slightly higher than the Kemper and Noxubee counties (22 percent and 23 percent, respectively) and notably higher than the state of Mississippi (19.2 percent). The civilian labor force within the study area is 4,972 persons, with an unemployment rate of 11.5 percent. This unemployment rate is higher than in Noxubee County (9.3 percent), Winston County (6.9 percent), and the state of Mississippi as a whole (6.4 percent), but lower than in Kemper County (14.1 percent) (Table 3-15).

3.12.1.2. Community Facilities and Services

Community facilities and services include public or publicly funded facilities such as police protection and other emergency services (fire protection), schools, hospitals and other health care facilities, libraries, schools, churches, recreation areas and parks, community centers, and one airport. To identify facilities and emergency services that could be potentially impacted by proposed project activities or emergency incidents along the length of the transmission lines, the study area is identified as the service area of various providers, where applicable, or the area within a 1-mile radius of the proposed project.

Based on a review of aerial imagery and online information including the USGS Geographic Names Information System database (USGS 2023c), community facilities and services available within a 1-mile radius of the proposed transmission lines include approximately 14 churches, 10 schools, nine cemeteries, three fire stations, three police/sheriff's departments, one hospital, and the Clark Community Center. The project is served by the Macon Fire Department as well as several Volunteer Fire Departments in Scooba, DeKalb, and Shuqualak.

3.12.1.3. Environmental Justice

TVA's activities reflect the TVA commitment to carrying out a statutory mission that benefits all the people of the Valley, including environmental justice and disadvantaged communities. Consistent with TVA's mission to serve the people of the Valley, TVA directs substantial resources to provide opportunities for disadvantaged communities within the TVA region to benefit from a variety of programs including Home Uplift, School Uplift, Small Business Uplift, Strategic Energy Management, Workforce Development, Generating Justice, and Connected Communities.

Environmental Justice has been defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies (EPA 2022) and seeks to ensure that minority and low-income populations do not bear disproportionately high and adverse human health or environmental effects from federal programs, policies, and activities. On February 11, 1994, President Clinton signed EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations). EO 12898 mandates some federal-executive agencies to consider environmental justice as part of the NEPA process. On January 27, 2021, President Biden issued EO 14008 (Tackling the Climate Crisis at Home and Abroad). Amongst other objectives, the EO calls for the federal government to make the climate crisis and environmental justice essential elements of domestic policy by developing programs, policies, and activities to address current and historic injustices, and by investing and building a clean energy economy that spurs economic opportunity for disadvantaged communities. In addition, President Biden issued EO 14096 (Revitalizing Our Nation's Commitment to Environmental Justice for All) on April 21, 2023, to supplement the foundational efforts of EO 12898 and pursue a comprehensive governmental approach to environmental justice (FR 2023).

Guidance for addressing environmental justice is provided by the Council on Environmental Quality (CEQ) Environmental Justice Guidance under NEPA (CEQ 1997). The CEQ defines minority as any race and ethnicity, as classified by the USCB, that is: Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; some other race (not mentioned above); two or more races; or a race whose ethnicity is Hispanic or Latino (CEQ 1997).

Identification of minority populations requires analysis of individual race and ethnicity classifications as well as comparisons of all minority populations in the region. Minority populations exist if either of the following conditions is met:

- The minority population of the impacted area exceeds 50 percent of the total population.
- The ratio of minority population is meaningfully greater (i.e., greater than or equal to 10 percentage points) than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997).

The nationwide poverty level is determined annually by the USCB and varies by the size of family and number of related children under 18 years of age. The 2023 USCB Poverty Threshold for an individual under the age of 65 is an annual income of $15,852, and for a family of four with two children, it is an annual income of $30,900 (USCB 2023). For the purposes of this assessment, low-income individuals are those whose annual household income is less than two times the poverty level. More encompassing than the base poverty level, this low-income threshold, also used by EPA in their delineation of low-income populations, is an appropriate measure for environmental justice consideration because current poverty thresholds are often too low to adequately capture the populations adversely affected by low-income levels, especially in high-cost areas (EPA 2024). According to EPA, the effects of income on baseline health and other aspects of susceptibility are not limited to those below the poverty thresholds. For example, populations having an income level from one to two times the poverty level also have worse health overall than those with higher incomes (Centers for Disease Control and Prevention

2013). A low-income environmental justice population exists if either of the following two conditions are met:

- The low-income population exceeds 50 percent of the total population.
- The ratio of low-income population significantly exceeds (i.e., by greater than or equal to 10 percentage points) that of the general population or other appropriate geographic areas of analysis.

Based on a review of the EPA's EJSCREEN tool, the proposed project is located in an area with high concentrations of minority residents and communities with appreciable percentages of low-income residents. Therefore, TVA conducted a more detailed evaluation using 2020 USCB Decennial Census data and 2018-2022 ACS data to identify specific block groups within the study area that exceed environmental justice thresholds. For the purposes of this analysis, a census block group constitutes an environmental justice community if it contains 50 percent or more aggregate minority or low-income population (the "Fifty Percent" analysis), or 10 percent or more aggregate minority or low-income population than the county or state average in which the block group is located (the "meaningfully greater" analysis). Figure 3-3 identifies the block groups within the study area that meet the specified criteria as environmental justice low-income populations.

Total minority populations (i.e., all non-white and Hispanic or Latino racial groups combined) comprise approximately 45 percent of the population of Mississippi, which is comparatively lower than the total minority population of Winston County (50 percent) and significantly lower than total minority populations in Kemper and Noxubee counties (approximately 69 percent and 74 percent respectively). Total minority populations in the study area account for approximately 72 percent, which is larger those of Winston County and the state of Mississippi. Additionally, 10 of the 12 block groups within the study area have minority populations that exceed 50 percent of the total population. Therefore, these 10 block groups meet the criterion for consideration as minority population groups subject to environmental justice considerations.

The percentage of the population of Mississippi living below the low-income threshold is 40.7 percent while the percentage in Winston County is notably higher at 47.3 percent. The population below the low-income threshold in Kemper and Noxubee counties is over 50 percent of the population in both counties. Additionally, approximately 58 percent of the population within the study area are considered low-income, with percentages for individual block groups ranging from approximately 29 percent to 78 percent of the population. Seven block groups have low-income populations that exceed 50 percent of the total population. Figure 3-3 identifies these block groups determined to meet the criterion for consideration as low-income population groups subject to environmental justice considerations.

3.12.2. Environmental Consequences

3.12.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not acquire new ROW to construct the proposed transmission lines, expand existing ROW, or construct new access roads. Therefore, there would be no change in local demographics, socioeconomic conditions, or community services, and there would be no impacts to environmental justice populations in association with the proposed action.

3.12.2.2. Alternative B – Action Alternative

3.12.2.2.1. Demographic and Economic Impacts

Under the Action Alternative, the proposed transmission line construction activities would occur over approximately 13 months and would entail the use of mobile crews comprised of contractors and/or full-time TVA staff. The construction workforce would be comprised of 40 workers and an additional 12 workers for clearing and access road installation. It is anticipated that most of these workers would be drawn from the TVA in-house labor force that currently resides in the region; however, some specialty workers and laborers not available within the area may be needed to support construction activities. Following construction, work crews would be present in the study area for occasional operation and maintenance activities. In both cases, given the relatively small workforce and that the majority of workers needed would likely be drawn from the existing labor force, impacts to demographics and local employment would be minor.

Potential economic impacts associated with the proposed project relate to direct and indirect effects of property acquisition, construction, and operations. Under the Action Alternative, TVA would acquire approximately 194 acres across 71 parcels for the development of the proposed transmission line ROWs. These easements would give TVA the right to construct, operate, and maintain the transmission system across the property owners' lands. TVA expects to utilize existing and/or new temporary access roads to access the ROW. Access roads would typically be located on privately-owned land for which TVA would acquire easement rights. In each case, landowners are compensated for the value of such rights and easements. Furthermore, most access roads are temporary. Only two access roads will be permanent to the transmission line ROW. Additionally, there are no known displacements required for development of the ROW easements and access roads. Construction and maintenance activities would also result in minor but beneficial impacts to the local economy through the purchases of materials and supplies, potential procurement of contract workers or additional services, and expenditure of the wages earned by the transient workforce in the local communities.

There is also the potential for a decrease in property value for those parcels in the vicinity of transmission lines. However, most of the new construction would take place along existing transmission line ROWs and in agricultural or forested areas; residential properties have been avoided to the greatest extent possible. As most homes in the area already have views of existing transmission line ROW or are separated from these structures by a vegetated buffer, any effects to local property values would be minor.

In addition, the implementation of the Action Alternative would help to increase power reliability in the area and support the growing load in the Macon, Scooba, and DeKalb, Mississippi areas. Also, it would help eliminate voltage stability issues in the area when nearby TVA power lines are out of service, add operational flexibility for taking maintenance and construction outages in lower Mississippi.

3.12.2.2.2. Community Facilities and Services

Direct impacts to community facilities occur when a community facility is displaced or access to the facility is altered. Neither the construction or operation of the transmission lines nor associated access roads would result in the displacement of community facilities or impede access to any facilities. Therefore, there would be no direct impacts to community facilities or services under the Action Alternative.

Indirect impacts occur when a proposed action or project results in a population increase that would generate greater demands for services and/or affect the delivery of such services. As the transmission line construction and maintenance would not result in notable impacts to local demographics, increased demands for services such as schools, churches, and healthcare facilities are not anticipated. In the event of an emergency along the transmission line ROW, local law enforcement, fire, and/or EMS response would likely be required. As noted above, there are three fire stations within a 1-mile radius of the proposed transmission lines. Additionally, Noxubee County, Macon City, and Shuqualak operate fire and police departments which could respond in the event of an emergency. As such, there are extensive emergency services available in the event of an emergency. In addition, the need for emergency services along the ROWs is anticipated to be a rare occurrence. Therefore, implementation of the Action Alternative would not have a notable impact on the demand for emergency services in the area.

3.12.2.2.3. Environmental Justice

As indicated in Table 3-15 and Figure 3-3, 10 block groups within the study area meet the criteria for consideration as environmental justice populations under EO 12898. Three block groups in the study area meet the criteria for identified minority populations and seven block groups in the study area meet both low-income and minority population criteria. Under the Action Alternative, construction of the proposed transmission lines could result in minor impacts to nearby residents, including temporary impacts such as increased traffic, noise, fugitive dust, and air emissions during the construction period, as well as long-term visual impacts and the potential for decreased property values. However, the proposed transmission lines would not result in any substantial long-term emissions or releases of air pollutants, noise, or hazardous materials that would have a direct impact on human health or welfare. Long-term impacts such as decreased visual impacts, property value, and land use limitations have been minimized through community and landowner involvement in the selection of the proposed transmission line routes, and the location of the proposed transmission lines would not result in any substantial long-term emissions or releases of air pollutants, noise, or hazardous materials that would have a direct impact on human health or welfare.

Additionally, while adverse impacts would be similarly experienced by all people living along the proposed transmission line corridor, environmental justice populations would bear a higher impact since a majority of the approximately 52-mile Midway-S. Macon-DeKalb Transmission Line corridor is located in areas considered environmental justice (low-income and/or minority) communities. Therefore, impacts of the proposed project would be disproportionate to environmental justice populations due to their prevalence in the area, however, adverse impacts would be minor due to the distance between residences and proposed project area. Moreover, these impacts are similar to impacts experienced by communities (environmental justice and non-environmental justice) living along TVA's transmission line network across the Valley.

3.13. Long-term and Cumulative Impacts

The presence of the proposed transmission lines would present long-term visual effects to the mostly rural character of the local area. However, because the proposed lines would traverse mostly rural areas and run parallel to existing transmission lines for significant portions of each respective route, the transmission lines would not be especially prominent in the local landscape. Likewise, the establishment of easements for the proposed ROW with local landowners would pose a long-term encumbrance on the affected properties, but the proposed routes would utilize existing transmission line easements (13.5 miles of 100-foot-wide on the Midway-S. Macon Transmission Line and 14.4 miles of 75-foot-wide ROW and 3.5 miles of 100-foot-wide on the S. Macon-DeKalb Transmission Line) to the extent practical. Various agricultural land uses could be practiced within the ROW, but any timber production within the ROW would be foregone for the life of the transmission line.

The availability of a reliable power supply is one factor in improving the overall infrastructure in the local area, which over time could make the area more attractive to additional commercial and residential development. However, the extent and degree of such development depends on a variety of factors and cannot be predicted accurately. Cumulative impacts of the construction, maintenance, and operation of the proposed transmission lines have been examined to the extent practicable in resource sections above. Thus, residential and commercial growth of this mainly rural area would be a minor, long-term and cumulative consequence of the proposed transmission system improvements.

3.13.1. Postconstruction Effects

3.13.1.1. Electric and Magnetic Fields

Transmission lines, like all other types of electrical wiring, generate both electric and magnetic fields (i.e., EMFs). The voltage on the conductors of a transmission line generates an electric field that occupies the space between the conductors and other conducting objects such as the ground, transmission line structures, or vegetation. A magnetic field is generated by the current (i.e., the movement of electrons) in the conductors. The strength of the magnetic field depends on the current, the design of the line, and the distance from the line.

The fields from a transmission line are reduced by mutual interference of the electrons that flow around and along the conductors and between the conductors. The result is even greater dissipation of the low energy. Most of this energy is dissipated on the ROW, and the residual very low amount is reduced to background levels near the ROW or energized equipment.

Magnetic fields can induce currents in conducting objects. Electric fields can create static charges in ungrounded, conducting materials. The strength of the induced current or charge under a transmission line varies with: (1) the strength of the electric or magnetic field, (2) the size and shape of the conducting object, and (3) whether the conducting object is grounded. Induced currents and charges can cause shocks under certain conditions by making contact with objects in an electric or magnetic field.

The proposed transmission lines have been designed to minimize the potential for such shocks. This is done, in part, by maintaining sufficient clearance between the conductors and objects on the ground. Stationary conducting objects, such as metal fences, pipelines, and highway guardrails that are near enough to the transmission lines to develop a charge (typically these would be objects located within the ROW) would be grounded by TVA to prevent them from being a source of shocks.

Under certain weather conditions, high-voltage transmission lines, such as the proposed 161-kV, may produce an audible low-volume hissing or crackling noise (Appendix F). This noise is generated by the corona resulting from the dissipation of energy and heat as high voltage is applied to a small area. Under normal conditions, corona-generated noise is not audible. The noise may be audible under some wet conditions, but the resulting noise level away from the ROW would be well below the levels that can produce interference with speech. Corona is not associated with any adverse health effects in humans or livestock.

Other public interests and concerns have included potential interference with AM radio reception, television reception, satellite television, and implanted medical devices. Interference with radio or television reception is typically due to unusual failures of power line insulators or poor alignment of the radio or television antenna and the signal source. Both conditions are readily correctable.

Implanted medical devices historically had a potential for power equipment strong-field interference when they came within the influence of low-frequency, high-energy workplace exposure. However, older devices and designs (i.e., those beyond five to 10 years old) have been replaced with different designs and different shielding that prevent potential for interference from external field sources up to and including the most powerful magnetic resonance imaging medical scanners. Unlike high-energy radio frequency devices that can still interfere with implanted medical devices, low-frequency, and low-energy powered electric or magnetic devices no longer potentially interfere (Journal of the American Medical Association 2007).

Research has been done on the effects of EMFs on animal and plant behavior, growth, breeding, development, reproduction, and production. Research has been conducted in the laboratory and under environmental conditions, and no adverse effects or effects on health or the above considerations have been reported for the low-energy power frequency fields (World Health Organization [WHO] 2007a). Effects associated with ungrounded, metallic objects' static charge accumulation and with discharges in dairy facilities have been found when the connections from a distribution line meter have not been properly installed on the consumer's side of a distribution circuit.

There is some public concern as to the potential for adverse health effects that may be related to long-term exposure to EMF. A few studies of this topic have raised questions about cancer and reproductive effects on the basis of biological responses observed in cells or in animals or on associations between surrogate measures of power line fields and certain types of cancer. Research has been ongoing for several decades.

The consensus of scientific panels reviewing this research is that the evidence does not support a cause-and-effect relationship between EMFs and any adverse health outcomes (e.g., American Medical Association 1994; National Research Council 1997; National Institute of Environmental Health Sciences 2002). Some research continues on the statistical association between magnetic field exposure and a rare form of childhood leukemia known as acute lymphocytic leukemia. A recent review of this topic by the WHO (International Association for Research on Cancer 2002) concluded that this association is very weak, and there is inadequate evidence to support any other type of excess cancer risk associated with exposure to EMFs.

TVA follows medical and health research related to EMFs, along with media coverage and reports that may not have been peer reviewed by scientists or medical personnel. No controlled laboratory research has demonstrated a cause-and-effect relationship between

low-frequency electric or magnetic fields and health effects or adverse health effects even when using field strengths many times higher than those generated by power transmission lines. Statistical studies of overall populations and increased use of low-frequency electric power have found no associations (WHO 2007b).

Neither medical specialists nor physicists have been able to form a testable concept of how these low-frequency, low-energy power fields could cause health effects in the human body where natural processes produce much higher fields. To date, there is no agreement in the scientific or medical research communities as to what, if any, electric or magnetic field parameters might be associated with a potential health effect in a human or animal. There are no scientifically or medically defined safe or unsafe field strengths for low-frequency, low-energy power substation or line fields.

The current and continuing scientific and medical communities' position regarding the research and any potential for health effects from low-frequency power equipment or line fields is that there are no reproducible or conclusive data demonstrating an effect or an adverse health effect from such fields (WHO 2007c). In the U.S., national organizations of scientists and medical personnel have recommended no further research on the potential for adverse health effects from such fields (American Medical Association 1994; U.S. Department of Energy 1996; National Institute of Environmental Health Sciences 1998).

Although no federal standards exist for maximum EMF field strengths for transmission lines, two states (New York and Florida) do have such regulations. Florida's regulation is the more restrictive of the two with field levels being limited to 150 milligauss at the edge of the ROW for lines of 230-kV and less. The expected magnetic field strengths at the edge of the proposed ROW would fall well within these standards. Consequently, the construction and operation of the proposed transmission line connectors are not anticipated to cause any significant impacts related to EMF.

EMFs would be produced along the length of the proposed transmission line. The strength of the fields within and near the ROW varies with the electric load on the line and with the terrain. Nevertheless, EMF strength attenuates rapidly with distance from the line and is usually equal to local ambient levels at the edge of the ROW. Thus, public exposure to EMFs would be minimal, and no significant impacts from EMFs are anticipated.

3.13.1.2. Lightning Strike Hazard

TVA transmission lines are built with overhead ground wires that lead a lightning strike into the ground for dissipation. Thus, a safety zone is created under the ground wires at the top of structures and along the line, for at least the width of the ROW. The NESC is strictly followed when installing, repairing, or upgrading TVA lines or equipment. Transmission line structures are well grounded, and the conductors are insulated from the structure. Therefore, touching a structure supporting a transmission line poses no inherent shock hazard.

3.13.1.3. Transmission Structure Stability

TVA transmission lines are designed to meet standards specified by the NESC. TVA designs their transmission lines such that a risk analysis of seismic hazards specifically for transmission line construction is not necessary. NESC states that as long as the design meets the wind and ice loading conditions that would create the most effect on the line, the transmission line would provide sufficient capacity to withstand seismic loading.

Single and double steel-pole structures similar to those shown in Figure 2-1 and 2-2 would be used for the proposed 161-kV transmission lines. These structures have demonstrated a good safety record. They are not prone to rot or crack like wooden poles, nor are they subject to substantial storm damage due to their low cross-section in the wind.

Additionally, all TVA transmission structures are examined visually at least once a year. Thus, the proposed structures do not pose any significant physical danger. For this reason, TVA does not typically construct barricades or fences around structures.

3.14. Unavoidable Adverse Environmental Impacts

The following unavoidable effects would result from implementing the proposed actions as described under the Action Alternative in Section 2.1.2.

- Clearing associated with construction of the proposed transmission line could result in a small amount of localized siltation.
- Trees would not be permitted to grow within the transmission line ROW or to a determined height adjacent to the ROW that would endanger the transmission line. In areas where the ROW would traverse forested areas, this would cause a change in the visual character of the immediate area and would segment some forested areas.
- Clearing and construction would result in the disruption and/or loss of some plant and wildlife, and the permanent loss of about 313 acres of forested habitat.
- Any burning of cleared material would result in some short-term air pollution. ROW construction would involve tree clearing and conversion of 63.27 acres of forested wetland to emergent or scrub-shrub wetland habitat.
- The proposed transmission line would result in minor, long-term visual effects on the landscape in the immediate local area.

3.15. Relationship of Local Short-Term Uses and Long-Term Productivity

Land within the ROWs of the proposed transmission lines would be committed to use for electrical system needs for the foreseeable future. The proposed ROWs would support the two separate 161-kV transmission lines (see Figure 1-1 and 1-2), with use of existing access roads outside the ROWs. Agricultural uses of the ROWs could and would likely continue. However, periodic clearing of the ROWs would preclude forest management within the ROWs for the operational life of the transmission line. These losses of long-term productivity with respect to timber production and as wildlife habitat are minor both locally and regionally.

3.16. Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those uses of resources that cannot be reversed. An example of an irreversible commitment is the mining and use of an ore, which once mined, cannot be replaced. Irretrievable commitments of resources are those that may occur over a period of time but that may be recovered. For example, filling a wetland area for a parking lot would irretrievably commit the property for as long as the parking lot remains.

The materials used for construction of the proposed transmission lines would be committed for the life of the line. Some materials, such as ceramic insulators and concrete foundations, may be irrevocably committed, but the metals used in equipment, conductors, and supporting steel structures could be recycled. The useful life of steel-pole transmission structures or laced-steel towers is expected to be at least 60 years. Thus, recyclable materials would be irretrievably committed until they are eventually recycled.

The ROW used for the transmission lines would constitute an irretrievable commitment of onsite resources, such as wildlife habitat, forest resources, and forested wetlands in that the approximate previous land use and land cover could be returned upon retirement of these facilities. In the interim, compatible uses of the ROW for the transmission lines could continue.

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Appendix A – Sherwood Injunction

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TENNESSEE

DONNA W. SHERWOOD, et al.,	)	
	)	
Plaintiffs,	)	
	)	
v.	)	No.: 3:12-CV-156-TAV-HBG
	)	
TENNESSEE VALLEY AUTHORITY,	)	
	)	
Defendant.	)	

INJUNCTION ORDER

For the reasons discussed in the Memorandum Opinion and Order entered contemporaneously with this Injunction Order, and for good cause being shown, it is hereby ordered, adjudged, and decreed as follows:

IT IS ORDERED that TVA is **ENJOINED** from further implementing the transmission line right-of-way vegetation management practice that has come to be known in this litigation as the "15-foot rule" until TVA has prepared and published an environmental impact statement pursuant to the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321–4370m12. TVA shall submit a request for dissolution of the injunction after completion of the procedural steps necessary to comply with NEPA. Plaintiffs will then have the opportunity to state their position with respect to the dissolution of the injunction.

IT IS FURTHER ORDERED that the terms of this injunction will remain in effect until the Court grants TVA's request for dissolution of the injunction.

IT IS FURTHER ORDERED that TVA will maintain buffer zones on the edges of its rights-of-way as described in TVA's 1997 and 2008 Line Maintenance Manuals:

a. When re-clearing 500-kV transmission lines on ROWs that are 200 feet wide, TVA will re-clear 150 feet, that is, 75 feet from centerline to outside edges, leaving a 25-foot buffer zone on each side.

b. On the more recently purchased 500-kV transmission line ROWs where 175 feet is all that is purchased, TVA will re-clear 150 feet, that is, 75 feet from centerline to outside edges, leaving a 12.5-foot buffer zone on each side.

c. When re-clearing 161-kV transmission lines, the structure type and height will determine the width.

i. On multiple-pole structures and single- and double-circuit steel tower lines where TVA has 150 feet of easement, TVA will re-clear 100 feet, that is, 50 feet from centerline to outside edges, leaving a 25-foot buffer zone on each side. Where TVA only has 100 feet of ROW, the entire 100 feet is re-cleared.

ii. On lines that utilize single-pole structures where TVA has an easement of 75 feet, the entire 75 feet will be re-cleared.

iii. On 69-kV transmission lines, re-clearing will be accomplished.

d. On easements with multiple transmission lines, the "centerline to outside edges" will apply to the transmission line nearest the outside boundary.

TVA will leave the existing trees in the wire zone so long as they do not pose an immediate hazard to the transmission lines.

TVA may remove or trim any trees in the wire zone of the right-of-way, or in the buffer zones of the right-of-way, or any danger tree outside the right-of-way, in accordance with its contract rights, that it deems to present an immediate hazard to its transmission lines.

In using the term "re-clearing" in this Order the Court is simply utilizing the terminology that TVA has used in its Line Maintenance Manuals and is making no determination as to whether TVA either has or has not cleared the right-of-way previously.

IT IS FURTHER ORDERED that where TVA has previously allowed a given landowner to trim his or her own trees, TVA shall continue to do so, except that TVA will have the right to immediately remove or trim any tree that it deems to present an immediate hazard to its transmission lines.

The Court accepts TVA's representations that it has budgeted $15 million for its yearly vegetation management and $14 million for vegetation management during Fiscal Year 2018 through 2020. TVA shall report its quarterly and cumulative annual spending levels to plaintiffs when those figures are reasonably available through its accounting department.

IT IS FURTHER ORDERED that TVA shall post a copy of this Order and any subsequent substantive Order in a prominent location on its website to inform the public and in particular the landowners on the right-of-way that TVA has been enjoined from further implementing the 15-foot rule, and to inform the public and landowners as to the practices that TVA is being ordered to follow pursuant to this Order.

IT IS FURTHER ORDERED that TVA is required to pay plaintiffs' reasonable attorney's fees and costs in this litigation related to the NEPA and mootness issues pursuant to the Equal Access to Justice Act ("EAJA") with reasonableness to be determined by the Court in accordance with the EAJA if the parties cannot agree on the amount.

TVA will inform the Court within **thirty (30) days** after entry of this Order of the measures taken to inform TVA employees and contractors involved in transmission line right-of-way vegetation management of the terms of this injunction.

If a party seeks to modify any provision of the injunction, the parties must first meet and confer, in order to attempt to reach agreement before applying to the Court.

The Court retains continuing jurisdiction to enforce this Order through contempt or otherwise, to clarify the injunction should the need arise, to determine whether the injunction should be dissolved, and for such other proceedings as may be appropriate.

IT IS SO ORDERED.

s/ Thomas A. Varlan
CHIEF UNITED STATES DISTRICT JUDGE

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Appendix B - Transmission Environmental Protection Procedures Right-Of-Way Vegetation Management Guidelines (Rev. (9) February 2022)

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Transmission Environmental Protection Procedures
Right-Of-Way Vegetation Management Guidelines

1.0 Overview

A. The Tennessee Valley Authority (TVA) must manage the vegetation on its rights-of-way and easements to ensure emergency maintenance access and routine access to structures, switches, conductors, and communications equipment. In addition, TVA must maintain adequate clearance, as specified by the National Electrical Safety Code, between conductors and tall growing vegetation and other objects. This requirement applies to vegetation within the right-of-way (ROW) as well as to trees located off the right-of-way.

B. Each year TVA assesses the conditions of the vegetation on and along its rights-of-way. This is accomplished by aerial inspections, ground inspections, periodic field inspections, aerial photography, LiDAR data and information from TVA personnel, property owners andthe general public. TVA utilizes this data to evaluate vegetation clearances and identifies vegetation on and off ROW that does or could potentially pose a risk to reliability.

C. TVA transmission foresters develop a vegetation re-clearing plan that is specific to each line segment and is based on terrain conditions, species mix, growth, and density.

2.0 Right-of-Way Management Methods

A. TVA takes an Integrated Vegetation Management (IVM) approach that is based on a carefully planned, multi-dimensional strategy developed in consultation with forestry and habitat experts. Integrated vegetation management aims to improve safety and prevent power outages by creating healthy and self-sustaining ecosystems in ROWs while ensuring compliance with regulatory standards (NERC 2006). These ecosystems foster beneficial, attractive and low-maintenance habitat while discouraging tall, woody species and other, more benign forms of vegetation can thrive. Integrated vegetation management encourages early successional native habitats that pose less threat to power reliability yet offer safe havens for desirable plants and animals.By combining selective use of herbicides with physical removal, integrated vegetation management can more thoroughly eradicate unsuitable vegetation and allow more compatible species to fill in, making it more difficult for tall-growing trees to re-establish.

TVA executes its transmission vegetation maintenance on a 3-year cycle based on data that is acquired by various inspection methods. LiDAR, ground inspection andaerial inspection data are utilized to evaluate the next year's scheduled work to determine the annual vegetation maintenance work scope. LiDAR technology provides a detailed vegetation threat analysis that can be used to assess risk as well as prioritize vegetation management work plans. This detailed analysis supports TVA's efforts to target incompatible species as well as promote the growth of compatible vegetation. This precision management approach is effective in reducing overall environmental impact by limiting work to specific areas of incompatibility.

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B. TVA uses a variety of herbicides specific to the species present with a variety of possible application techniques. The method most often implemented is selective application from the ground with backpack sprayers or vehicle-mounted sprayers. However, other techniques and methods, such as those described in section 3.0, may be utilized when circumstances dictate. Any herbicides used are applied in accordance with applicable state and federal laws and regulations. Only herbicides registered with the United States Environmental Protection Agency (USEPA) are used.

C. In very steep terrain, in sensitive environmental areas, in extensive wetlands, at stream banks, and in sensitive property owner land use areas, hand clearing may be utilized. Hand clearing is recognized as one of the most hazardous occupations documented by the Occupational Health and Safety Administration.

D. TVA does not encourage tree re-clearing by individual property owners because of the high hazard potential of hand clearing, possible interruptions of the line, and electrical safety considerations for untrained personnel that might do the work.

E. Mechanical mowers not only cut the tall saplings and seedlings on the right-of-way, it also shatters the stump and the supporting near-surface root crown. The tendency of resistant species to re-sprout from the root crown and shattered stumps can produce a multi-stem dense stand in the immediate area. Repeated use of mowers on short cycle re-clearing with many original stumps re-growing in the above manner can create a single species thicket or monoculture. With the original large root system and multiple stems, the resistant species can produce re-growth at the rate of 5-10 feet in a year. In years with high rainfall, the growth can reach 12-15 feet in a single year. These dense, monoculture stands can become nearly impenetrable for even large tractors. Such stands have low diversity, little wildlife food or nesting potential, and become a property owner concern. Selective herbicide application may be used to control monoculture stands.

3.0 Herbicide Program

A. TVA has worked with universities (such as Mississippi State University, University of Tennessee, Purdue University and others), chemical manufacturers, other utilities, U.S. Department of Transportation, U.S. Fish and Wildlife Service (USFWS), and U.S. Forest Service (USFS) personnel to explore options for vegetation control. The results have provided strong recommendations to use species-specific, low volume herbicide applications in more situations. Research, demonstrations, and other right-of-way programs show a definite improvement of rights-of-way treated with selective low-volume applications of new herbicides using a variety of application techniques and timing. Table 1 below identifies herbicides currently used on TVA rights-of-way.Table 2 identifies pre-emergent herbicides currently being used on bare ground areas on TVA rights-of-way and in substations. Table 3 identifies TGRs that may be used on tall trees that have special circumstances that require trimming on a regular cycle, e.g., restrictions on complete removal. The rates of application utilized are those listed on the U.S. Environmental Protection Agency (USEPA) approved label and consistent with utility standard practice throughout the Southeast.

Table 1 - Herbicides Currently Used on TVA Rights-of-Way

Trade Name	Active Ingredient	Label Signal Word
Accord/Accord XRT II	Glyphosate/Liquid	Caution
Arsenal	Imazapyr/Liquid/Granule	Caution
Chopper	Imazapyr/RTU	Caution
Clearstand	Imazapyr/Metsulfuron Methyl/Liquid	Caution
Escort	Metsulfuron Methyl/Dry Flowable	Caution
Garlon 4 Ultra	Triclopyr/Liquid	Caution
Habitat	Imazapyr/Liquid	Caution
Krenite S	Fosamine Ammonium	Caution
Milestone VM	Aminopyralid/Liquid	Caution
Pathfinder II	Triclopyr/RTU	Caution
Polaris	Imazapyr/Liquid	Caution
Rodeo	Glyphosate/Liquid	Caution
Roundup	Glyphosate/Liquid	Caution
Roundup Pro	Glyphosate	Caution
Stalker	Imazapyr/Liquid	Caution
Streamline	Aminocyclopyrachlor/ Metsulfuron Methyl/Liquid	Caution
Transline	Clopyralid/Liquid	Caution
Viewpoint	Imazapyr/Aminocyclopyrachlor/ Metsulfuron Methyl/Liquid	Caution

Table 2 - Pre-Emergent Herbicides Currently Used for Bare Ground Areas TVA Rights-of-Way

Trade Name	Active Ingredients	Label Signal Word
Arsenal 5G	Imazapyr/Granule	Caution
Sahara	Diuron/Imazapyr	Caution
SpraKil SK-26	Tebuthiuron/Diuron/Granules	Caution
SpraKil S-5	Tebuthiuron/Granules	Caution
Topsite	Diuron/Imazapyr	Caution

Table 3 - Tree Growth Regulators (TGRs) Currently Used on TVA Rights-of-Way

Trade Name	Active Ingredients	Label Signal Word
Profile 2SC	TGR-paclobutrazol	Caution
TGR	Flurprimidol	Caution

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B. The herbicides listed in Table 1 and 2 and TGRs listed in Table 3 have been evaluated in extensive studies in support of registration applications and label requirements. Many have been reviewed in the USFS vegetation management environmental impact statements (EISs), and those evaluations are incorporated here by reference (USFS 1989a, 1989b, 2002a, and 2002b). Electronic copies can be accessed at https://cdxnodengn.epa.gov/cdx-enepa-public/action/eis/search. The result of these reviews has been a consistent finding of limited environmental impact beyond that of control of the target vegetation. All the listed herbicides have been found to be of low environmental toxicity when applied by trained applicators that are following the label and registration procedures, including prescribed measures, such as buffer zones, to protect threatened and endangered species.

C. Low volume herbicide applications are recommended since research demonstrates much wider plant diversity after such applications. There is better ground erosion protection and more wildlife food plants and cover plants develop. In most situations, there is increased development of wild flowering plants, pollinator plants and shrubs. In conjunction with herbicides, the diversity and density of low-growing plants provide control of tall-growing species through competition.

D. Herbicides are used in place of rotary mowing to avoid damage to nesting and tunneling wildlife. This method retains ground cover year around with a better mix of food species and associated high- protein insect populations for birds in the right seasons. Most also report less damage to soils (even when compared with rubber-tired equipment).

E. Best Management Practices (BMPs) governing application of herbicides are contained within *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities* (TVA 2017) which is incorporated by reference. Herbicides can be liquid, granular, or powder and can be applied aerially or by ground equipment and may be selectively applied or broadcast, depending on the site requirements, species present, and condition of the vegetation.Water quality considerations include measures taken to keep herbicides from reaching streams whether by direct application or through runoff of or flooding by surface water. "Applicators" must be trained, licensed, and follow manufacturers' label instructions, USEPA guidelines, and respective state regulations and laws.

F. When herbicides are used, their potential adverse impacts are considered in selecting the compound,formulation, and application method. Herbicides that are designated "Restricted Use" by USEPA require application by or under the supervision of applicators certified by the respective state control board. Applications are done either by TVA or by contractors in accordance with the following guidelines identified in the TVA BMP manual (TVA 2017):

1. The sites to be treated are selected and application directed by the appropriate TVA official.
2. A pre-flight walking or flying inspection is made within 72 hours prior to applying herbicides aerially. This inspection ensures that no land use changes have occurred, that sensitive areas are clearly identified to the pilot, and that buffer zones are maintained.
3. Aerial application of liquid herbicides will normally not be made when surface wind speeds exceed 5 miles per hour, in areas of fog, or during periods of temperature inversion.

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4. Pellet application will normally not be made when the surface wind speeds exceed 10 miles per hour or on frozen or water saturated soils.
5. Herbicide application should follow manufacturers' label specifications.
6. Application during unstable, unpredictable, or changing weather patterns is avoided. Equipment and techniques are used that are designed to ensure maximum control of the spray swath with minimum drift.
7. Herbicides are not applied to surface water or wetlands unless specifically labeled for aquatic use. Filter and buffer strips will conform at least to federal and state regulations and any label requirements. The use of aerial or broadcast application of herbicides is not allowed within a streamside management zone (SMZ) adjacent to perennial streams, ponds, and other water sources containing sensitive aquatic resources. Hand application of aquatic use herbicides are used only selectively for use within SMZs containing sensitive aquatic resources.
8. For aerial applications, buffers and filter strips (200 feet minimum width) are maintained next to agricultural crops, gardens, farm animals, orchards, apiaries, horticultural crops, and other valuable vegetation.
9. Herbicides are not applied in the following areas or times: (a) in city, state, and national parks or forests or other special areas without written permission and/or required permits; (b) off the right-of-way; and (c) during rainy periods or during the 48-hour interval prior to rainfall predicted with a 20 percent or greater probability by local forecasters when soil active herbicides are used.

G. TVA currently uses primarily low volume applications of foliar and basal applications, e.g., Accord (Glyphosate), Arsenal (Imazapyr), Clearstand (Imazapyr/ Metsulfuron Methyl), Milestone VM (Aminopyralid) and Streamline (Aminocyclopyrachlor / Metsulfuron Methyl).

4.0 Benefits

A. Proper maintenance—including vegetation management—of the ROW and its supporting facilities is crucialto ensuring the reliable transmission of affordable electrical power. Unmanaged and poorly maintained vegetation can cause electricity outages, wildfires, soil erosion, and water quality issues. Utility companies that adopt long-term IVM approaches often benefit from significant vegetation management cost savings, which can be reflected in customer rates.

B. ROW also provides important wildlife habitats. As wildlife habitats in the United States are lost to development, these ROWs become increasingly important. The IVM approach can create natural, diverse, and sustaining ecosystems, such as a meadow transition habitat. A variety of wildlife species (including threatened and endangered species) consider these habitats home, such as butterflies, songbirds, small mammals, and deer. These habitats also encourage the growth of native plant species and can increase plant diversity.

C. Invasive and exotic species are often a problem on the ROW, and, consequently, the surrounding land. IVM techniques (such as selective herbicide application) can minimize this problem, while ensuring native and endangered species are not affected.

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5.0 References

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Appendix C – Stream Crossings Along the Proposed Transmission Line and Access Roads

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Appendix C - Stream Crossings within the Proposed 161-kV Midway-South Macon- Dekalb Transmission Line Rights-of-Way

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
S001	Perennial	Category A (50, 50)	Unnamed tributary (UT) to Blackwater Creek.	East of substation. OHW approx. 6-8' wide. Location offset from NWI.	Riverine	33.097065	-88.837070
S002	Perennial	Category A (50, 50)	UT Wolf Creek	Not on topo, high turbid flow. OHW approx. 5-6'.	Riverine	33.091593	-88.785664
S003	Perennial	Category A (50, 50)	Wolf Creek	Lot of meanders, oxbows. Turbid flow. OHW approx. 20-30', Top of bank approx. 30-40'.	Riverine	33.092727	-88.761429
S004	Intermittent	Category A (50, 50)	UT Wolf Creek	Inter. on topo. OHW approx. 6-8'.	Riverine	33.093013	-88.739053
S005	Intermittent	Category A (50, 50)	UT Wolf Creek	Not on topo. North of clearcut. OHW approx. 3-4'.	Riverine	33.093226	-88.736953
S006	Intermittent	Category A (50, 50)	UT Wolf Creek	East of clearcut. Moderate clean flow. OHW approx. 4'.	Riverine	33.093457	-88.73244
S007	Intermittent	Category A (50, 50)	UT Wolf Creek	Starts at headcut from E007. Short run to S003. OHW approx. 2-3'.	Riverine	33.093746	-88.729605
S008	Intermittent	Category A (50, 50)	UT Wolf Creek	Old CMP in channel at centerline. OHW approx. 1.5-2'.	Riverine	33.095064	-88.726485
S009	Perennial	Category A (50, 50)	Hashuqua Creek	Perennial on topo. High turbid flow due to recent rainfall. OHW approx. 20-30'.	Riverine	33.105751	-88.381073

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
S010	Perennial	Category A (50, 50)	UT Hashuqua Creek	Inter. on topo. High turbid flow due to recent rainfall. OHW approx. 12-15’.	Riverine	33.106708	-88.671970
S011	Perennial	Category A (50, 50)	UT Hashuqua Creek	Smaller channel that flows into P002. OHW approx. 1.5’.	Riverine	33.106882	-88.664580
S012	Perennial	Category A (50, 50)	UT Hashuqua Creek	Small channel that flows out of P002 and into P003. OHW approx. 1.5’.	Riverine	33.106594	-88.661023
S013	Intermittent	Category A (50, 50)	UT Poplar Creek	Appears to be overflow branch of S014. Flowing due to recent rainfall. OHW approx. 1.5-2’.	Riverine	33.105700	-88.647461
S014	Intermittent	Category A (50, 50)	UT Poplar Creek	Inter. On topo, thin riparian buffer. OHW approx. 1.5-2’.	Riverine	33.105670	-88.647370
S015	Perennial	Category A (50, 50)	UT Poplar Creek	Turbid due to recent rainfall. Inter. On topo. OHW approx. 3-4’.	Riverine	33.105018	-88.638642
S016	Perennial	Category A (50, 50)	UT to Noxubee River	Top of bank width, approx. 3-5', depth approx. 1-4', cattle crossing, minimal riparian buffer. OHW approx. 2-3’.	Riverine	33.104580	-88.632363
S017	Intermittent	Category A (50, 50)	UT to Noxubee River	Top of bank width, approx. 3-4', depth approx. 1-2', at toe-of-slope of pond. Bank full due to recent rainfall.	Riverine	33.103707	-88.620137

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
S018	Intermittent	Category A (50, 50)	UT to Noxubee River	Original channel appears to be west in tree line. Stream is now flowing down cleared road. OHW approx. 3-4'.	Riverine	33.103349	-88.614812
S019	Perennial	Category A (50, 50)	UT to Noxubee River	Adjacent RR bridge to west. Within W025. OHW approx. 3-8'.	Riverine	33.083917	-88.570887
S020	Perennial	Category A (50, 50)	UT to Noxubee River	Adjacent RR bridge to west. Appears channelized to the east. 15-20' wide.	Riverine	33.070281	-88.571990
S020R	Intermittent	Category A (50 ft)	NA	Approx. 1 ft wide channel that begins at W034R on the west side of access road AR83 (Carter Rd) and flows east through a culvert under the access road.	Riverine	33.103372	-88.688963
S021R	Intermittent	Category A (50 ft)	NA	Approx. 10 ft wide channelized stream surrounded by pine plantation. Channel flows parallel with the west side of an access road.	Riverine	33.095515	-88.581873
S022R	Intermittent	Category A (50 ft)	NA	Approx. 3-4 ft wide channel that flows southwest from P014R to its confluence with an unnamed	Riverine	33.094952	-88.575738

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
				tributary to the Noxubee River.			
S020a	Perennial	Category A (50, 50)	Dry Creek	Riparian areas mowed within ROW, channel approx. 35 feet wide.	Riverine	33.052054	-88.562977
S020b	Perennial	Category A (50, 50)	Macedonia Creek	Riparian areas mowed within ROW. Channel approx. 40-60 feet wide.	Riverine	33.035684	-88.561272
S020c	Intermittent	Category A (50, 50)	UT to Macedonia Creek	Channel 4-6 feet wide, channel mostly dry with sporadic sections of flow.	Riverine	33.034728	-88.561084
S020d	Perennial	Category A (50, 50)	UT to Shuqualak Creek	Riparian areas mowed within ROW. Channel approximately 6-10 feet wide.	Riverine	33.017286	-88.561056
S021	Intermittent	Category A (50 ft)	NA	Approx. 15 ft wide channel with fish and groundwater table connection.	Riverine	33.014901	-88.560994
S022	Perennial	Category A (50 ft)	NA	Approx. 25 ft wide channel with fish.	Riverine	33.002154	-88.560906
S023	Perennial	Category A (50 ft)	NA	Approx. 30 ft wide channel with fish.	Riverine	32.992644	-88.559829
S024	Perennial	Category A (50 ft)	NA	Approx. 33 ft wide channel with fish.	Riverine	32.991901	-88.559823
S025	Perennial	Category A (50 ft)	Windhams Creek	Approx. 10 ft wide channel with fish.	Riverine	32.983975	-88.557796
S026	Intermittent	Category A (50 ft)	NA	Approx. 18 ft wide channel within TL ROW.	Riverine	32.971285	-88.555733
S027	Perennial	Category A (50 ft)	NA	Approx. 25 ft wide channel within TL ROW.	Riverine	32.971208	-88.555706

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
S028	Perennial	Category A (50 ft)	Shuqualak Creek	Approx. 30 ft wide channel that flows under road.	Riverine	32.970352	-88.555128
S029	Intermittent	Category A (50 ft)	NA	Approx. 20 ft wide channel with fish.	Riverine	32.948397	-88.541003
S030	Perennial	Category A (50 ft)	NA	Approx. 12 ft wide channel located downstream of E025. Fish present.	Riverine	32.921537	-88.523997
S031	Perennial	Category A (50 ft)	Sid Creek	Approx. 30 ft wide channel that flows under road at confluence with S032.	Riverine	32.895542	-88.506232
S032	Perennial	Category A (50 ft)	Wahalak Creek	Approx. 70 ft wide channel that flows under road at confluence with S031.	Riverine	32.895068	-88.506038
S033	Intermittent	Category A (50 ft)	NA	Approx. 4 ft wide channel with fish. Flows from PFO wetland.	Riverine	32.893571	-88.505019
S034	Perennial	Category A (50 ft)	NA	Approx. 25 ft wide channel within TL ROW.	Riverine	32.880869	-88.496475
S035	Intermittent	Category A (50 ft)	NA	Approx. 20 ft wide channel within TL ROW.	Riverine	32.841210	-88.467747
S036	Perennial	Category A (50 ft)	Little Scooba Creek	Approx. 35 ft wide channel within TL ROW.	Riverine	32.817970	-88.459278
S037	Intermittent	Category A (50 ft)	NA	Approx. 2-3 ft wide channel that flows southwest across TL ROW and merges with S038 south of ROW. Channel is adjacent to W066.	Riverine	32.821033	-88.485053
S038	intermittent	Category A (50 ft)	NA	Approx.2-4 ft wide channel that flows into P011	Riverine	32.822490	-88.486769

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
				on north side of TL ROW, then meanders along the easement in a southeasterly direction until just north of W066, at which point the channel continues south of the ROW past the confluence with S037.			
S039	Perennial	Category A (50 ft)	Flat Scooba Creek	Approx. 40-50 ft wide channel that flows southeast across a TL ROW and then under a highway bridge. Channel is adjacent to W067.	Riverine	32.823289	-88.498671
S040	Perennial	Category A (50 ft)	Big Scooba Creek	Approx. 15-20 ft wide channel that flows southeast across a TL ROW and then under a highway bridge.	Riverine	32.815259	-88.523473
S041	Intermittent	Category A (50 ft)	N/A	Approx. 1-2 ft wide channel that flows from a roadside ditch to W075.	Riverine	32.814869	-88.525385
S042	Perennial	Category A (50 ft)	Big Scooba Creek	Approx. 30-35 ft wide channel that flows southeast across a TL ROW, then under a highway bridge.	Riverine	32.812824	-88.531873
S043	Perennial	Category A (50 ft)	NA	Approx. 25-30 ft wide channel that flows into a TL ROW from the north side, then flows approx. 0.2	Riverine	32.805970	-88.548543

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
				miles in a northeasterly direction along the south side of the ROW, parallel with the highway, before exiting the ROW on the north side.			
S044	Intermittent	Category A (50 ft)	NA	Approx. 3-5 ft wide channel that flows northeast across a TL ROW. This ROW runs parallel with the forest edge on the north side and a highway on the south side.	Riverine	32.801307	-88.562099
S045	Intermittent	Category A (50 ft)	NA	Approx. 2-3 ft wide channel that flows south across a TL ROW, then through a culvert under a highway.	Riverine	32.798532	-88.570186
S046	Intermittent	Category A (50 ft)	NA	Approx. 2-3 ft wide channel that flows from W079 to a culvert under the highway. The channel is located within a TL ROW.	Riverine	32.793455	-88.585532
S047	Perennial	Category A (50 ft)	Hamilton Branch	Approx. 15 ft wide channel that flows south across a TL ROW, then under a highway bridge.	Riverine	32.791692	-88.589137
S048	Perennial	Category A (50 ft)	Pole Branch	Approx. 7-25 ft wide channel that flows south across a TL ROW, then under a highway bridge.	Riverine	32.788042	-88.597454

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
S049	Perennial	Category A (50 ft)	Sucarnoochie River	Approx. 60 ft wide channel that flows south across a TL ROW. A cow pasture is adjacent to the channel along the left descending bank.	Riverine	32.787418	-88.606198
S050	Intermittent	Category A (50 ft)	NA	Approx. 3-4 ft wide channel that flows north across TL ROW.	Riverine	32.787373	-88.625823
S051	Perennial	Category A (50 ft)	NA	Approx. 10-25 ft wide channel that flows north across TL ROW and has been impacted by beaver dams.	Riverine	32.787430	-88.628528
S052	Intermittent	Category A (50 ft)	NA	Approx. 3 ft wide channel that begins at W080 within a TL ROW and flows north across the ROW.	Riverine	32.785560	-88.643614
S053	Perennial	Category A (50 ft)	NA	Approx. 3-4 ft wide channel located within a TL ROW. This segment is part the same stream as S055, but is located downstream and northwest of S055.	Riverine	32.784236	-88.654550
S054	Intermittent	Category A (50 ft)	NA	Approx. 5 ft wide channel that flows north toward confluence with the Sucarnoochie River. This segment is located within the	Riverine	32.782316	-88.667660

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
				forested northern edge of a TL ROW.			
S055R	Intermittent	Category A (50 ft)	NA	Approx. 5-7 ft wide channel that flows northwest through a culvert under an access road.	Riverine	32.782202	-88.652029
S056R	Intermittent	Category A (50 ft)	NA	Approx. 2-3 ft wide channel that flows east along the south side of an access road and merges with S057.	Riverine	32.785836	-88.618824
S057R	Perennial	Category A (50 ft)	NA	Approx. 3-18 ft wide channel that flows north through a culvert under an access road, then to W085 within a TL ROW.	Riverine	32.785787	-88.618725
P001	Pond	Category A (50, 50)	NA	Approximately 2-acre pond, small portion (approx. 0.2 acre) located within ROW.	Depress	33.1049	-88.6906
P002	Pond	Category A (50, 50)	NA	Approximately 5-acre pond, small portion (<0.1 acre) located within ROW. Beaver dam observed on south side of ROW.	Depress	33.1067	-88.6629
P003	Pond	Category A (50, 50)	NA	Small approx. 0.16-acre impoundment, wooded around periphery of pond.	Depress	33.1064	-88.6604

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
P004	Pond	Category A (50, 50)	NA	Approx. 6-acre manmade pond. Approx. 0.38 acre within ROW.	Depress	33.1034	-88.6197
P005	Pond	Category A (50, 50)	NA	Approx. 1.1 acre pond within TL ROW.	Depress	33.032396	-88.560777
P006	Pond	Category A (50, 50)	NA	Approx. 1.3 acre pond within TL ROW.	Depress	33.006873	-88.560994
P007	Pond	Category A (50, 50)	NA	Approx. 2.4 acre pond partially within TL ROW.	Depress	32.964677	-88.552006
P008	Pond	Category A (50, 50)	NA	Approx. 2.1 acre, fairly dewatered pond partially within TL ROW.	Depress	32.911179	-88.517221
P009	Pond	Category A (50, 50)	NA	Approx. 0.66 acre pond partially within TL ROW.	Depress	32.817066	-88.475631
P010	Pond	Category A (50, 50)	NA	Approx. 0.15 acre pond partially within TL ROW.	Depress	32.819258	-88.482697
P011	Pond	Category A (50, 50)	NA	Approx. 0.23 acre pond within TL ROW along S038.	Depress	32.824020	-88.488495
P012	Pond	Category A (50, 50)	NA	Approx. 1.68 acre pond located within a TL ROW, just north of W070.	Depress	32.819601	-88.509297
P013	Pond	Category A (50, 50)	NA	Approx. 0.17 acre pond located along the western edge of W083.	Depress	32.787783	-88.602047
P014R	Pond	Category A (50, 50)	NA	Approx. 0.44 acre pond located along the east side of an access road.	Depress	33.095004	-88.575561

Sequence ID	Stream Type	Streamside Management Zone Category (RB, LB)	Stream Name	Field Notes (using sequence IDs)	HGM Code	Latitude	Longitude
P015R	Pond	Category A (50, 50)	NA	Approx. 0.95 acre pond located along the north side of an access road; adjacent to W033R on the south side of the access road.	Depress	33.090569	-88.583928
P016R	Pond	Category A (50, 50)	NA	Approx. 1.45 acre pond located along the north side of an access road.	Depress	33.090981	-88.594605

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Appendix D – Access Road Crossings at Little Scuba Floodway & Floodplain Crossings along Transmission Lines and Access Roads

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Midway-South Macon-Scooba-Dekalb, MS Transmission Line
Access Road Crossing Little Scooba Creek Floodway

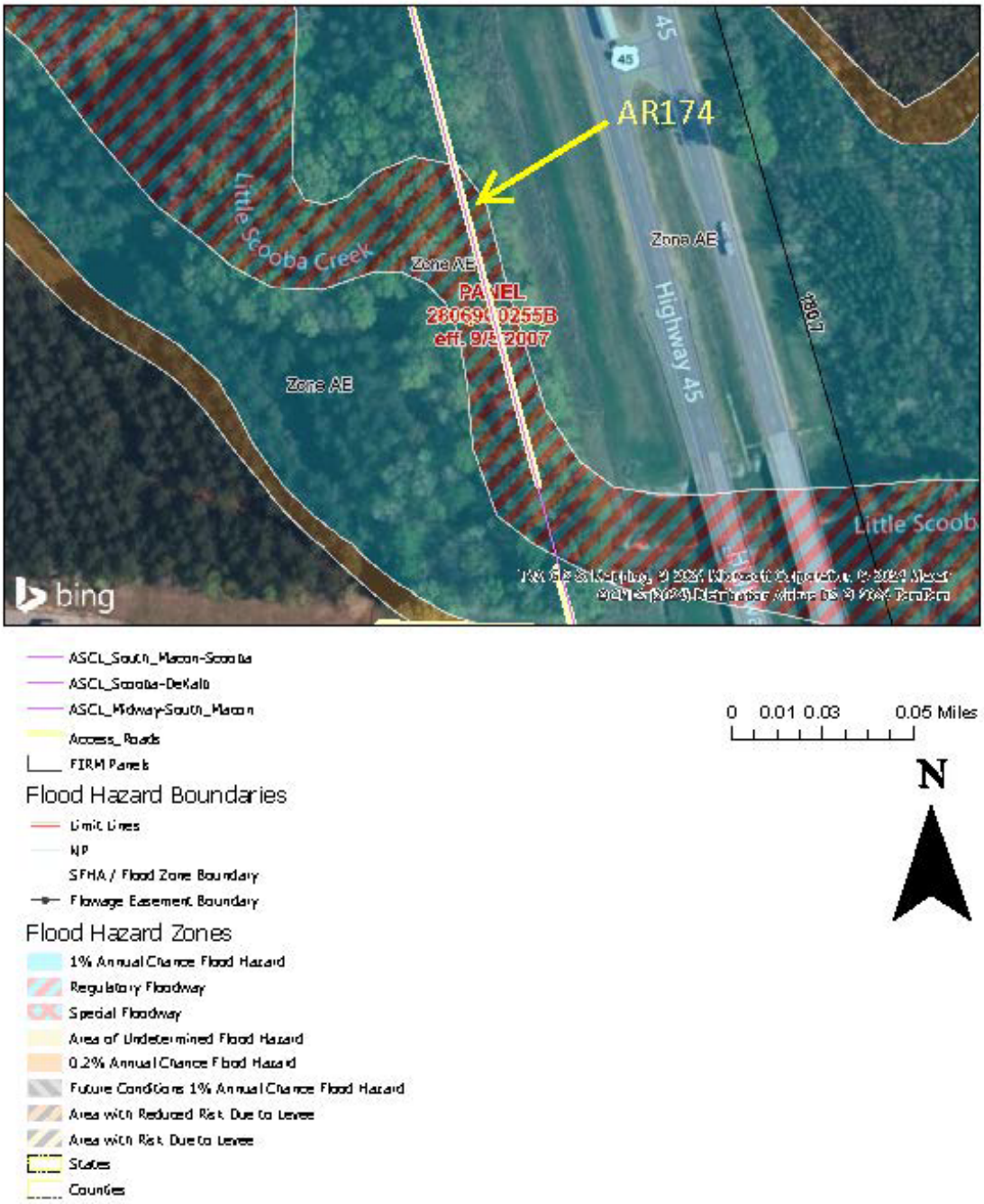

Figure FP-1: Little Scooba Creek Floodway and AR174

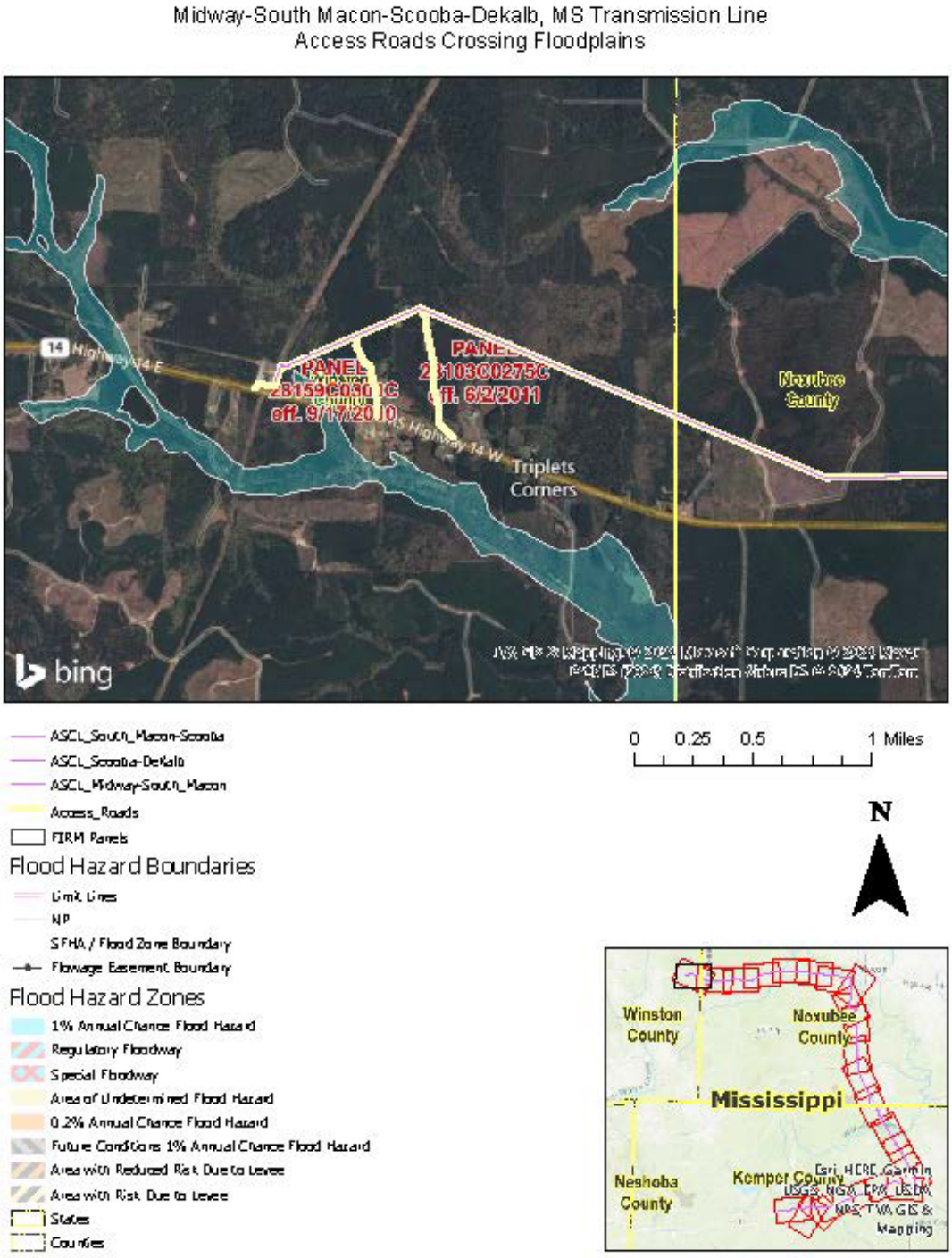

Figure D-1: Locations where the project crosses floodplains

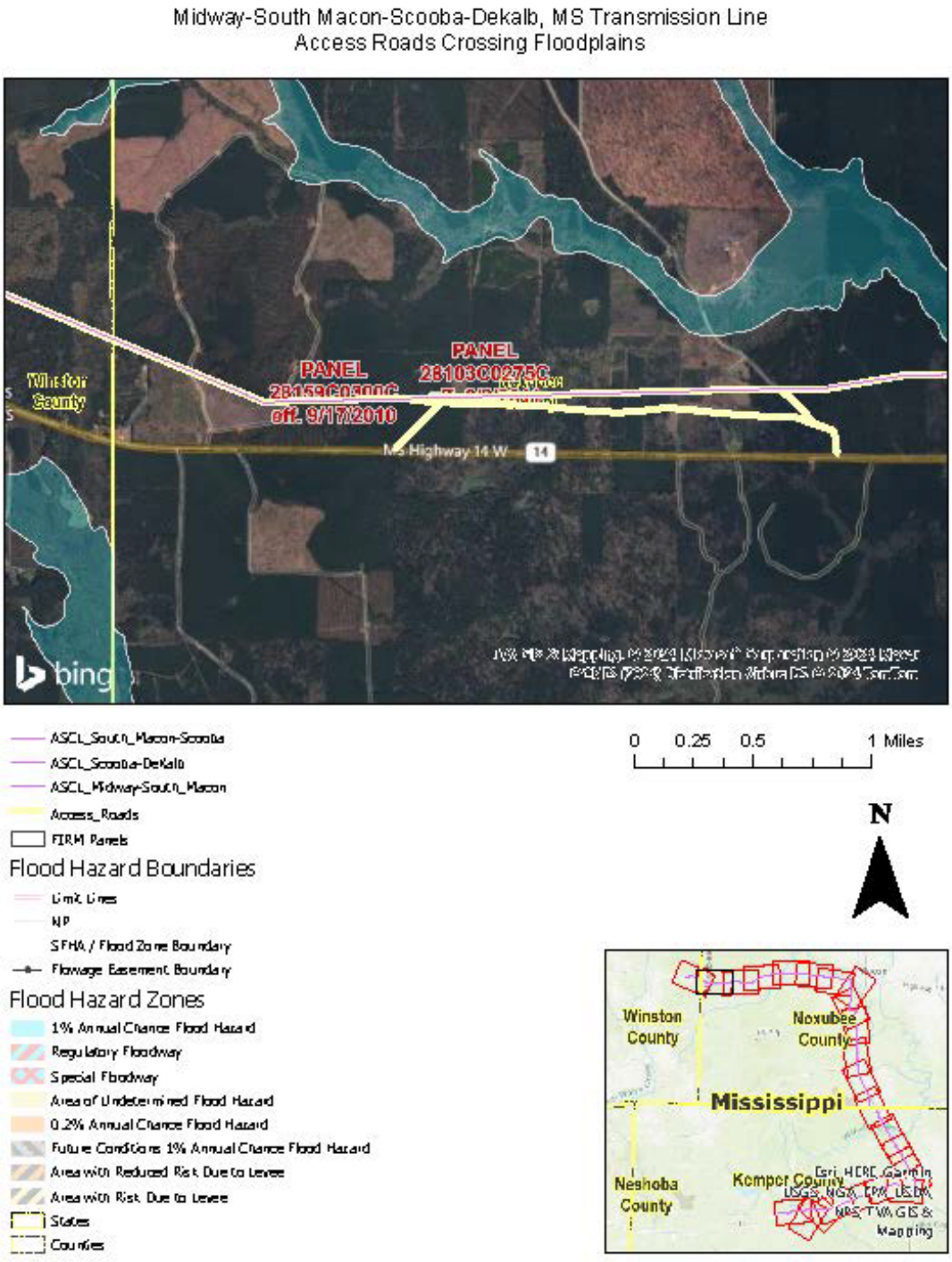

Figure D-2: Locations where the project crosses floodplains

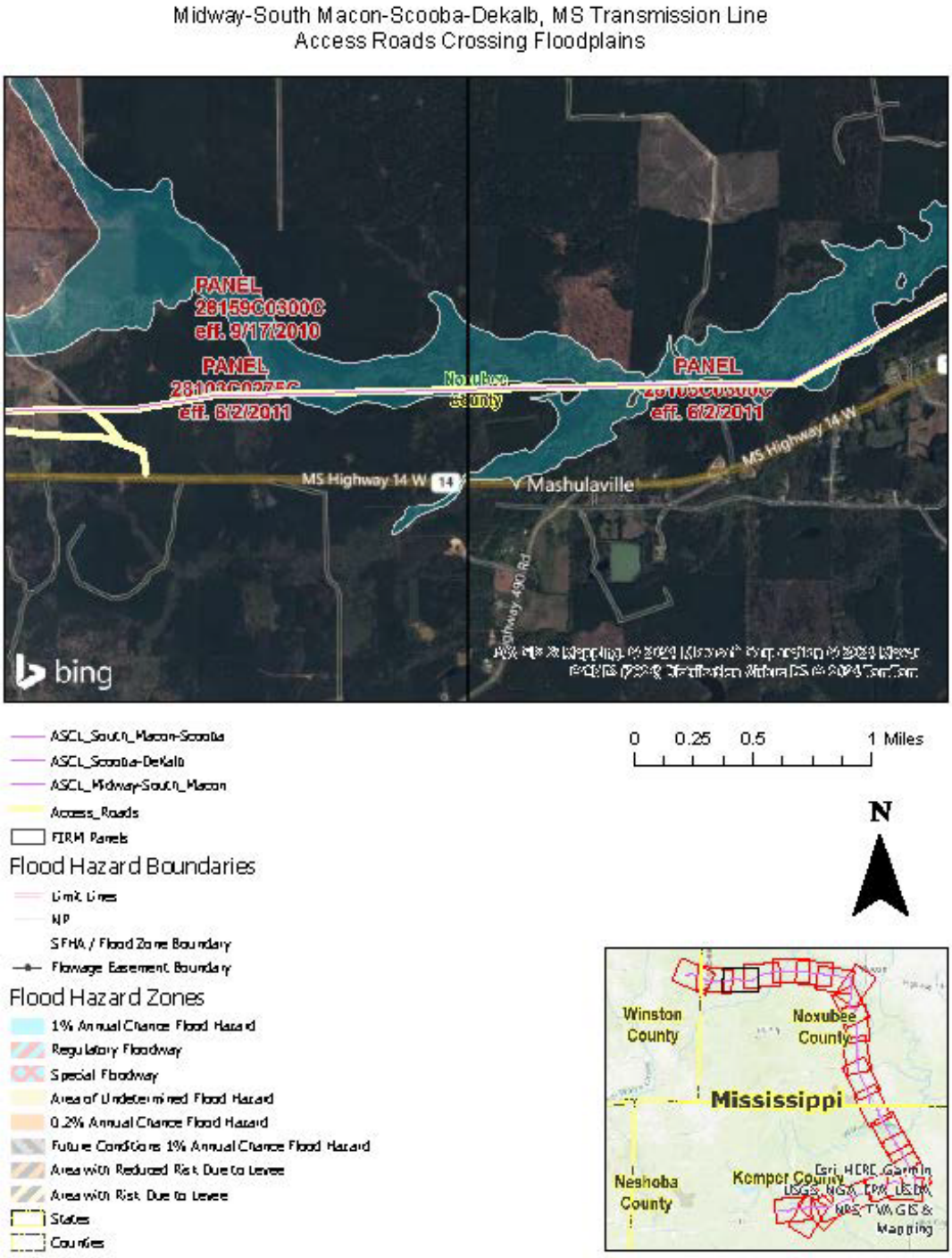

Figure D-3: Locations where the project crosses floodplains

Midway-South Macon-Scooba-Dekalb, MS Transmission Line
Access Roads Crossing Floodplains

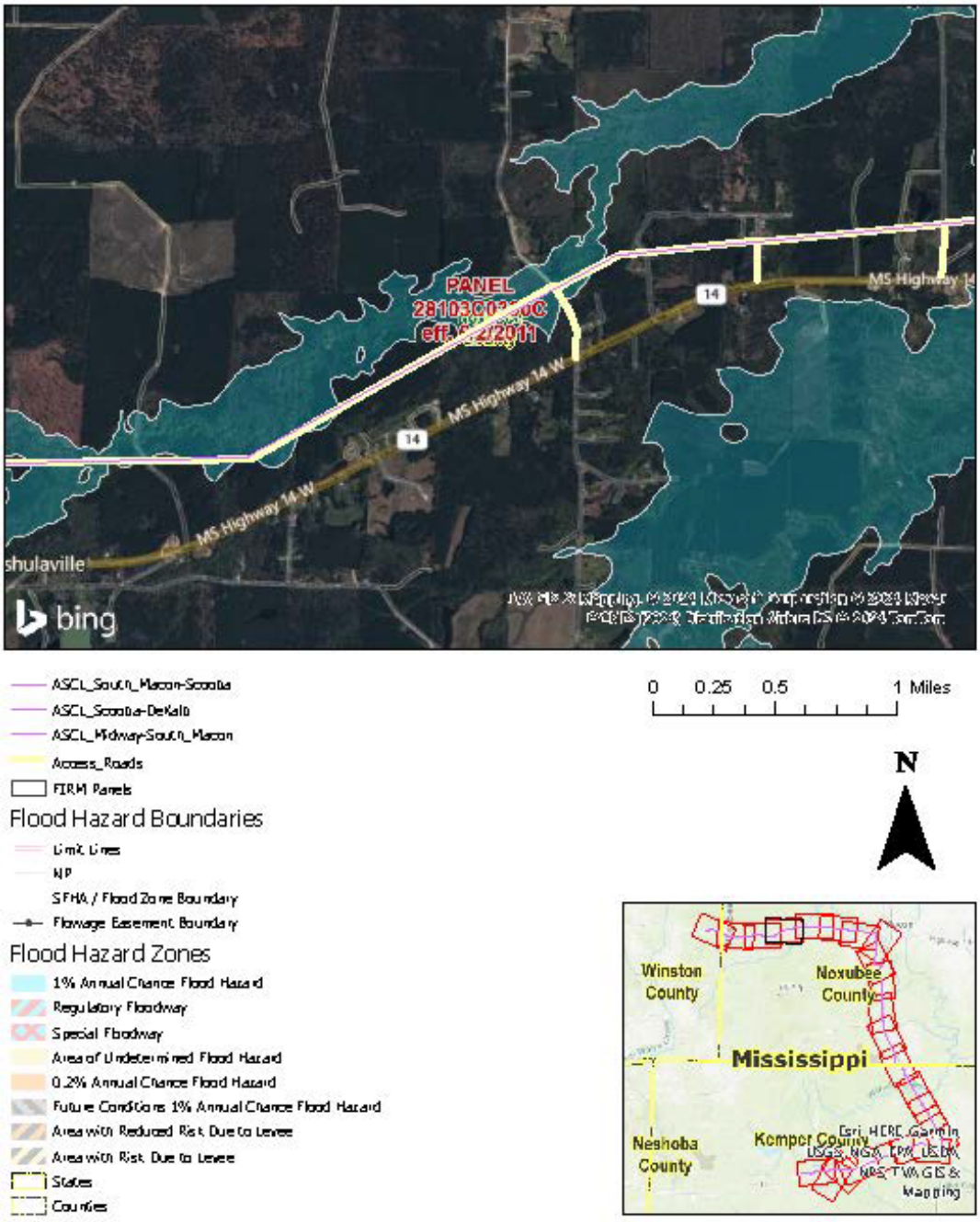

Figure D-4: Locations where the project crosses floodplains

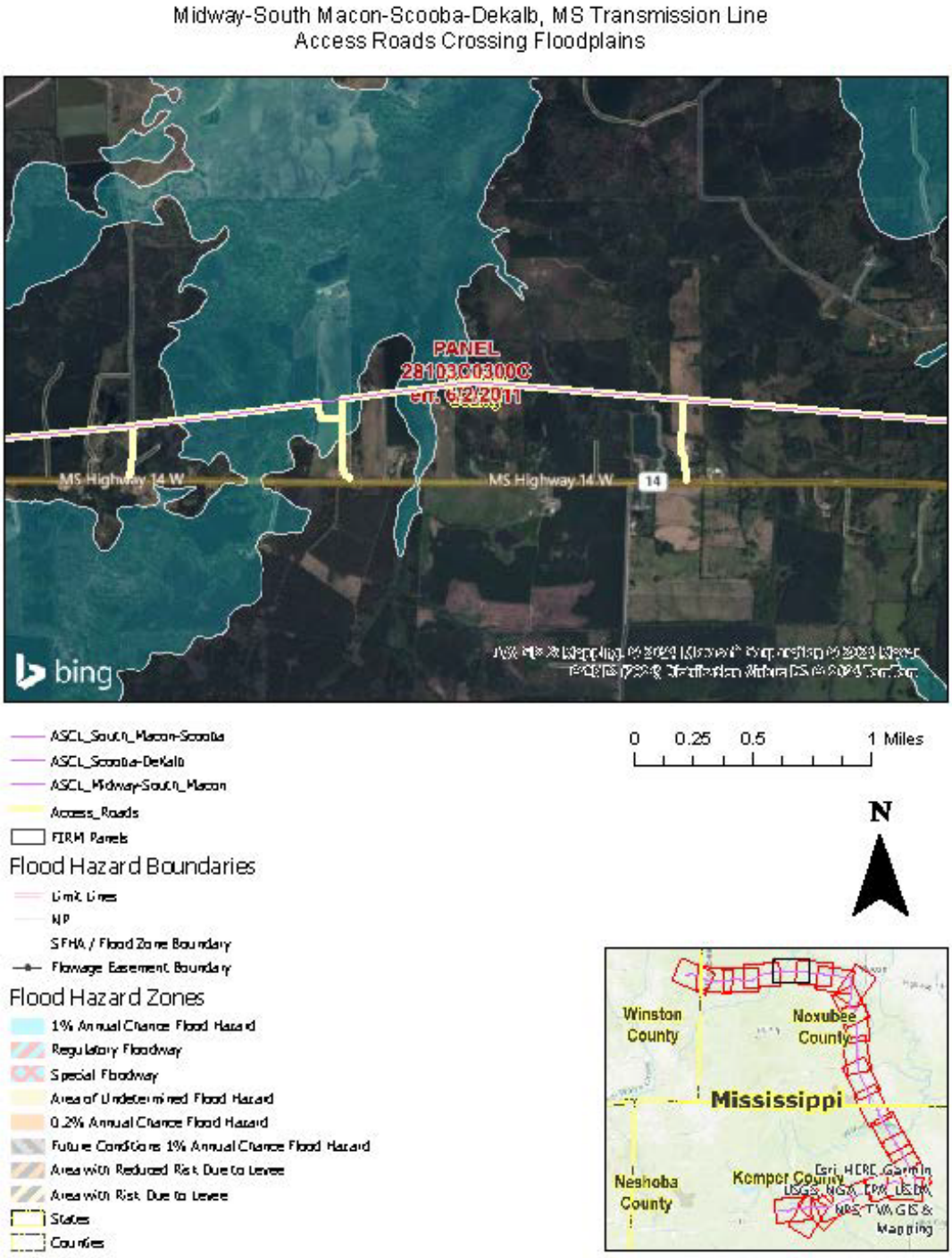

Figure D-5: Locations where the project crosses floodplains

Midway-South Macon-Scooba-Dekalb, MS Transmission Line
Access Roads Crossing Floodplains

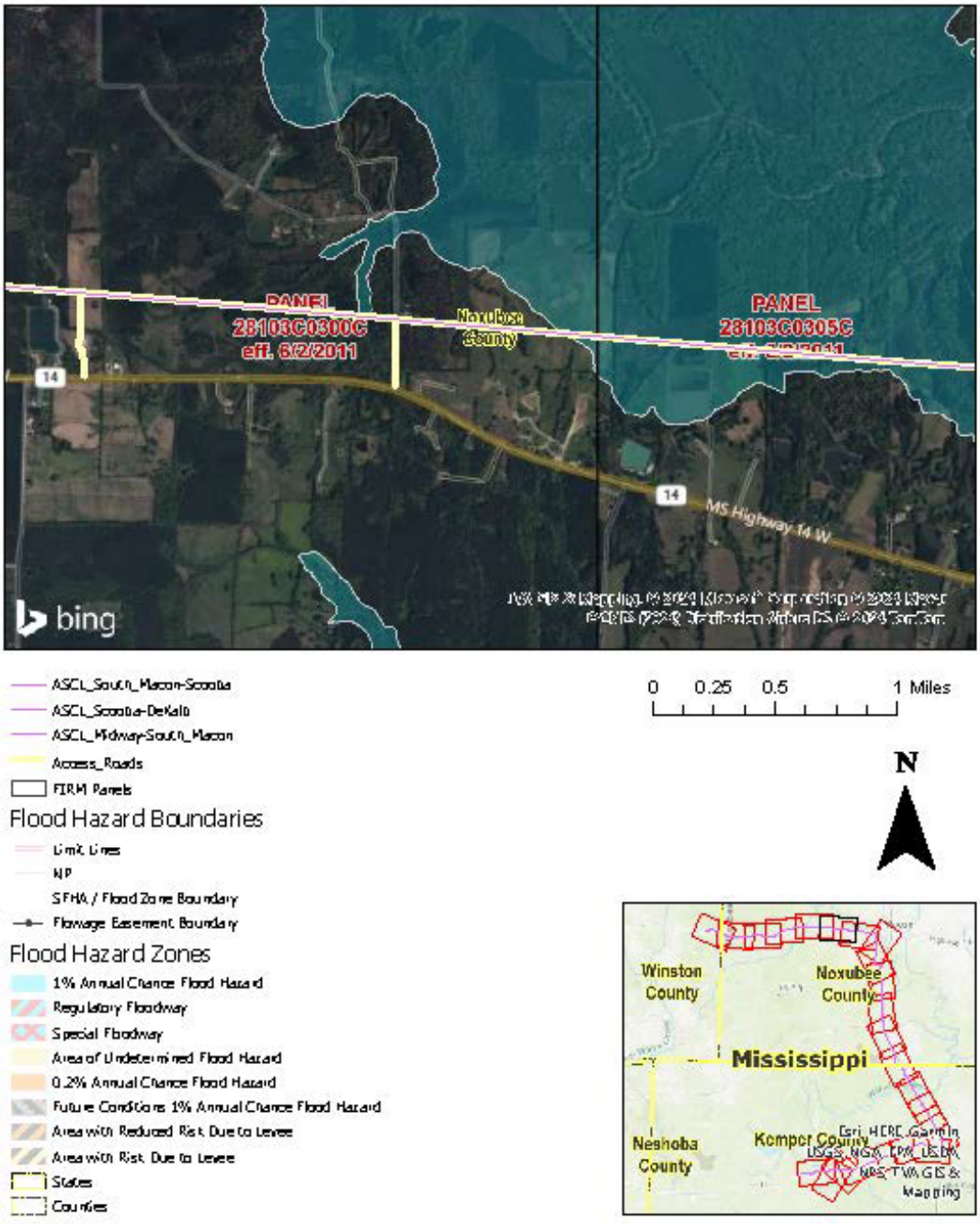

Figure D-6: Locations where the project crosses floodplains

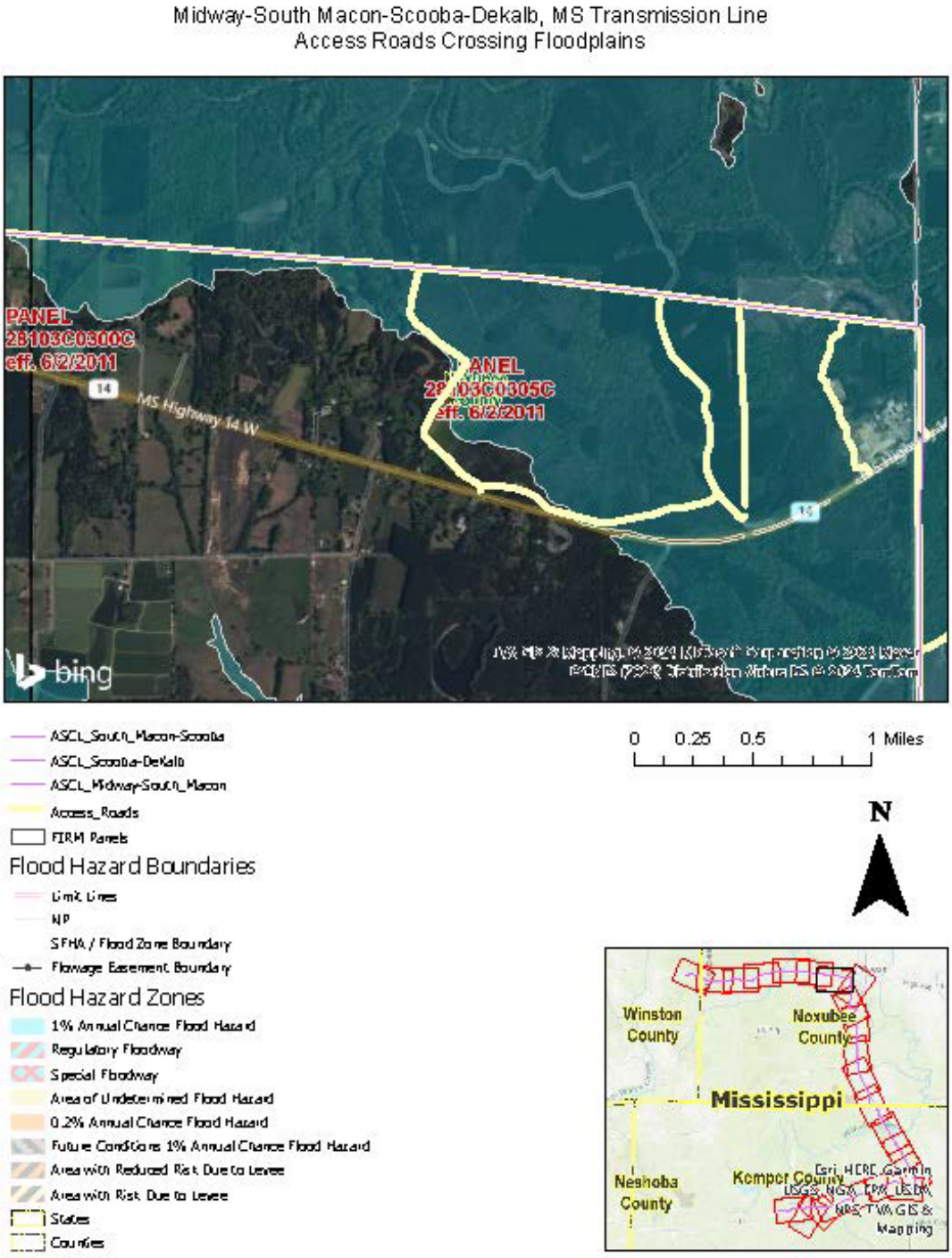

Figure D-7: Locations where the project crosses floodplains

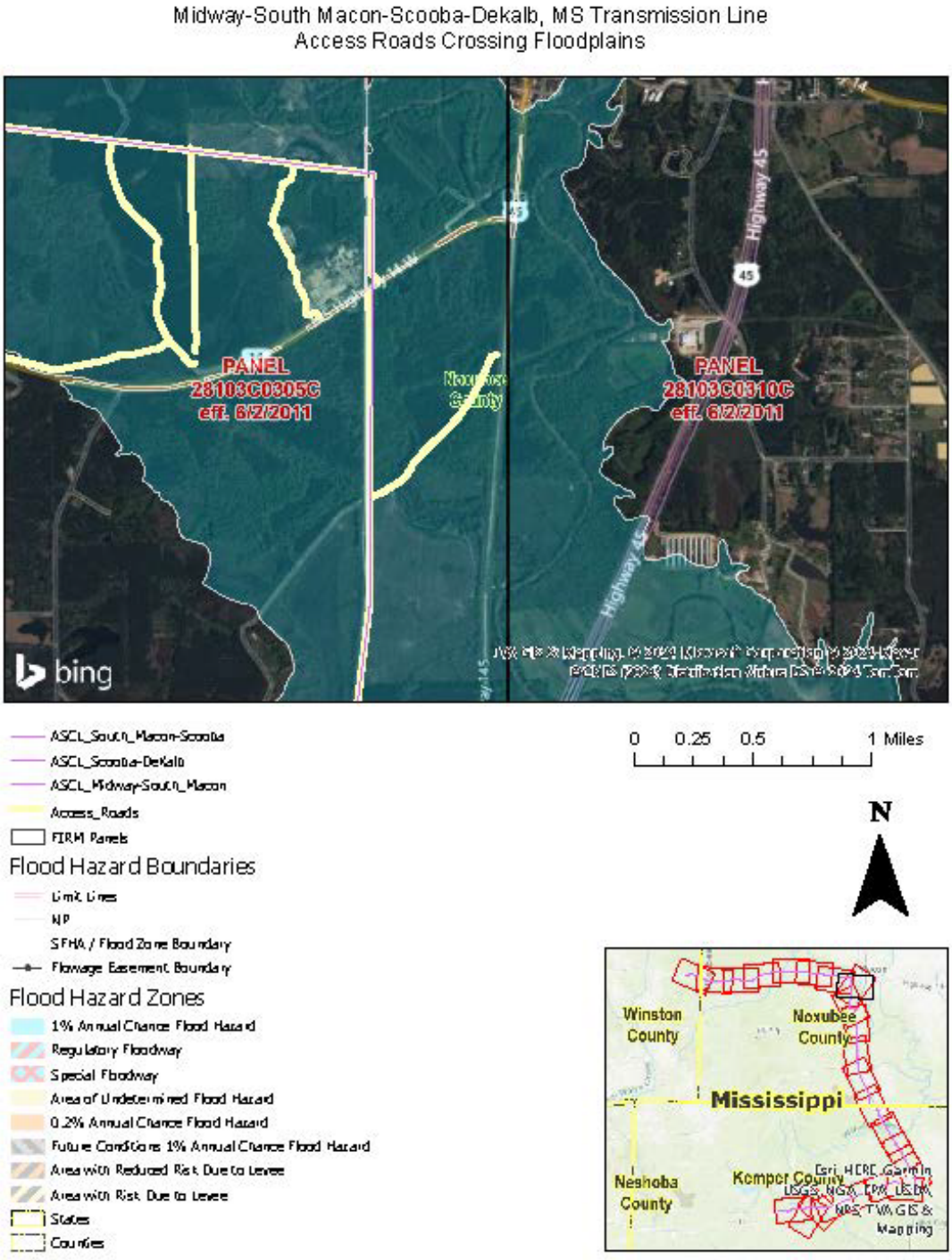

Figure D-8: Locations where the project crosses floodplains

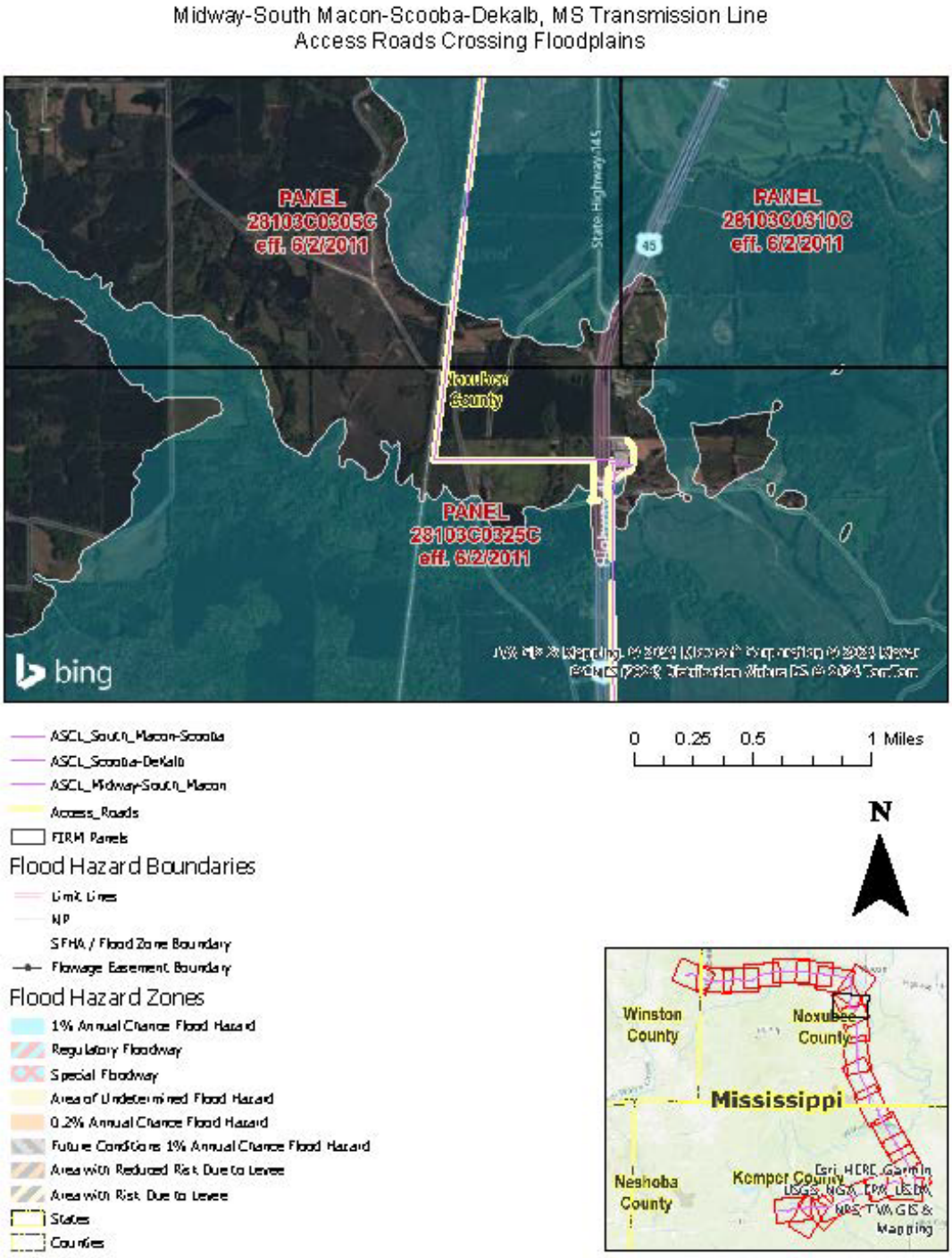

Figure D-9: Locations where the project crosses floodplains

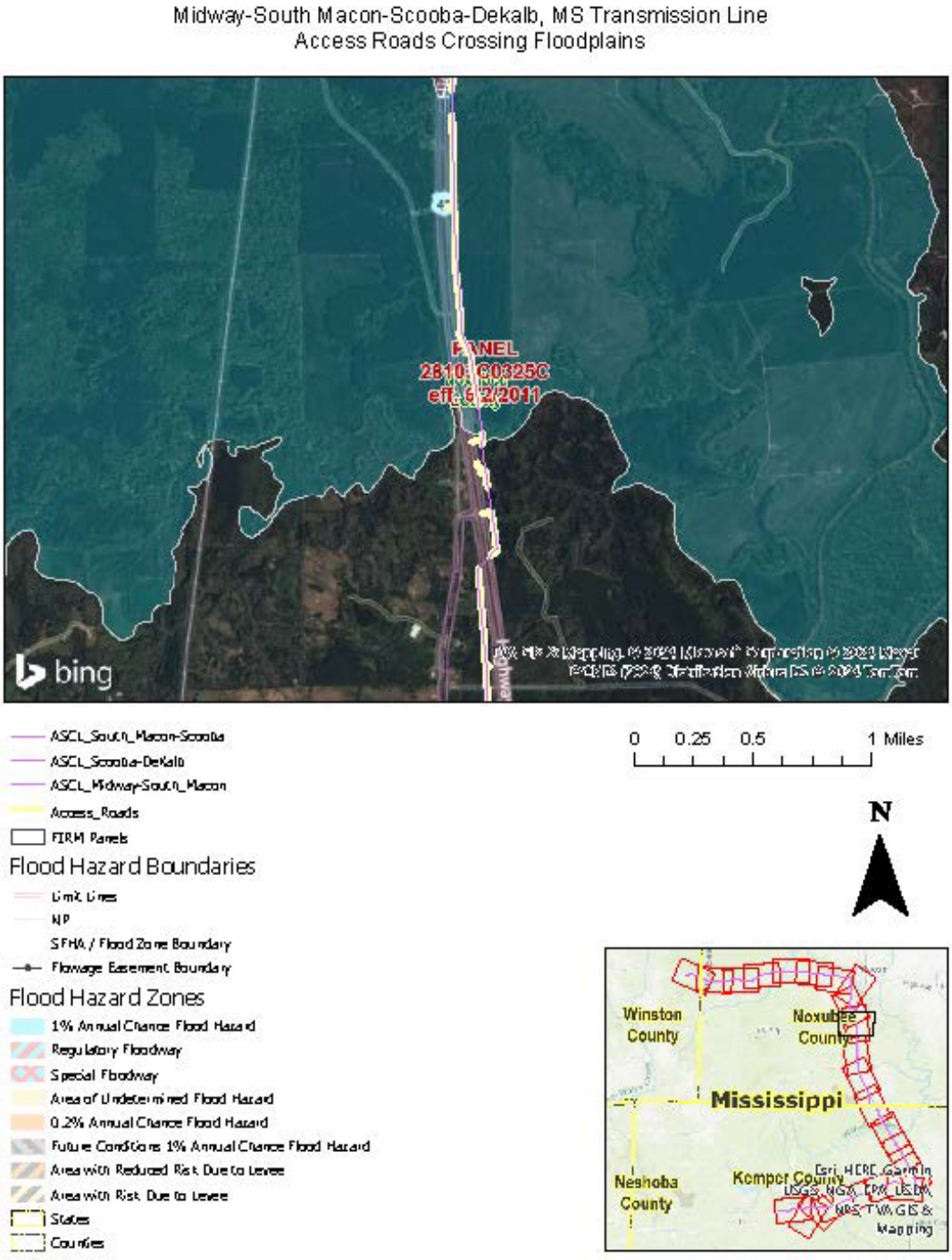

Figure D-10: Locations where the project crosses floodplains

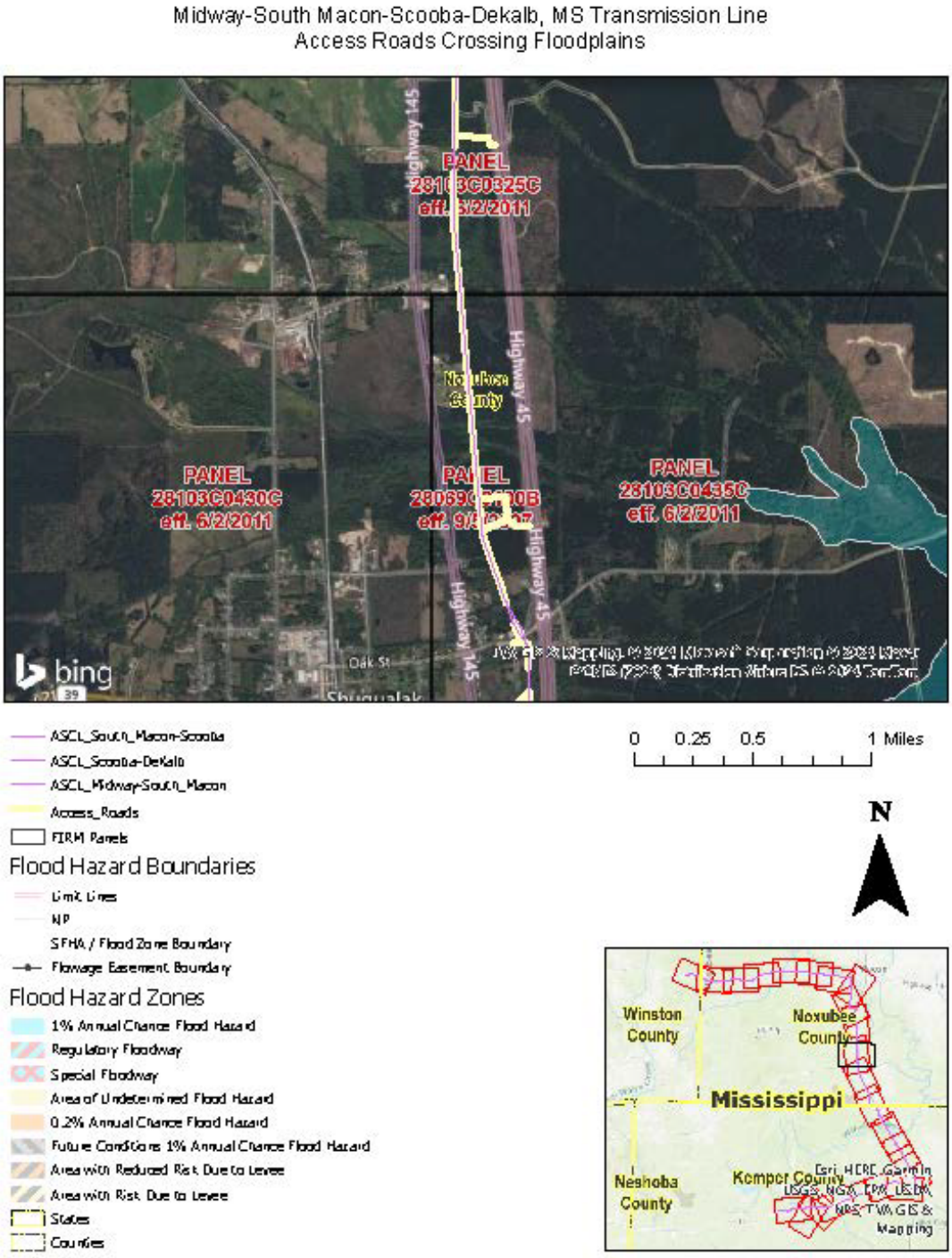

Figure D-11: Locations where the project crosses floodplains

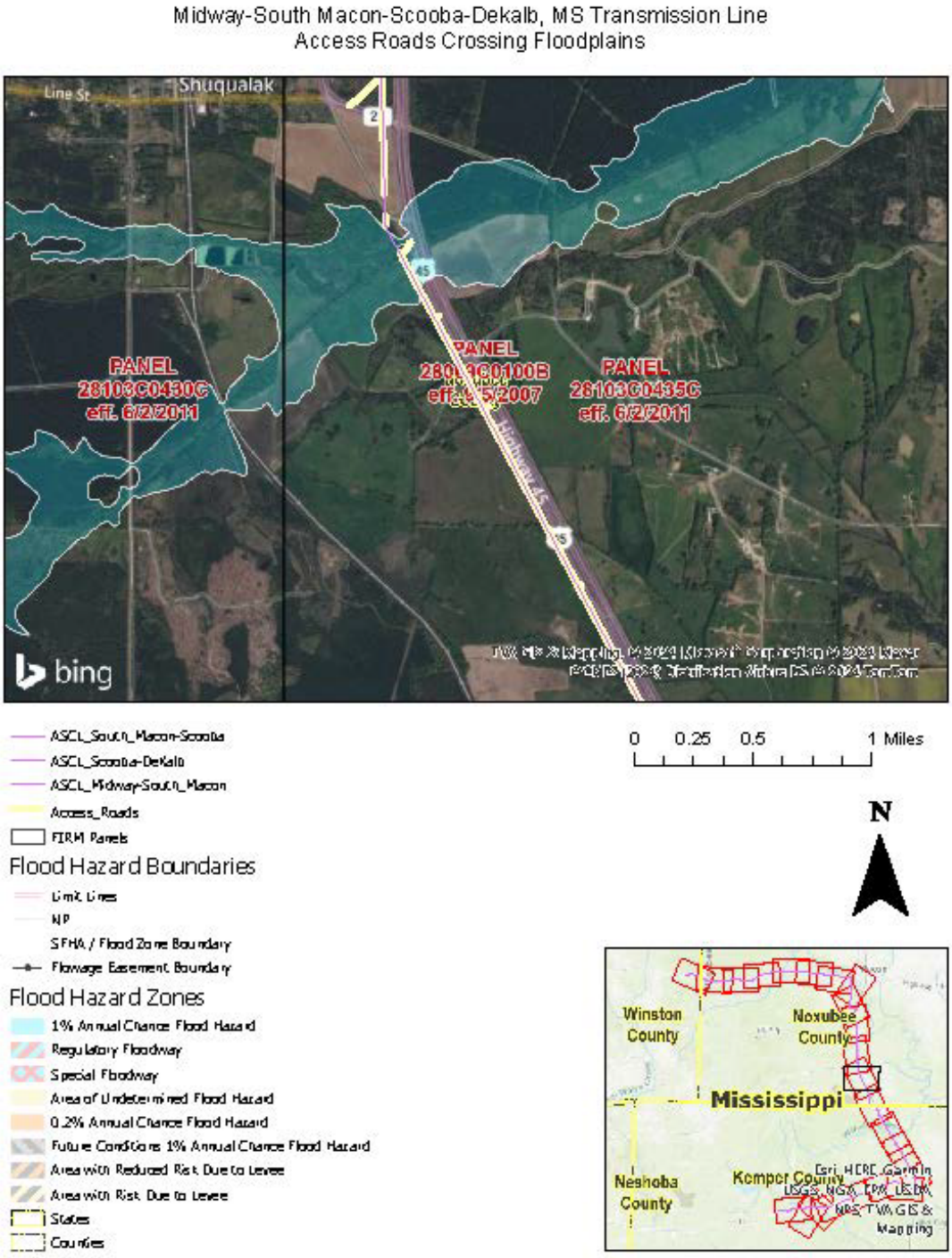

Figure D-12: Locations where the project crosses floodplains

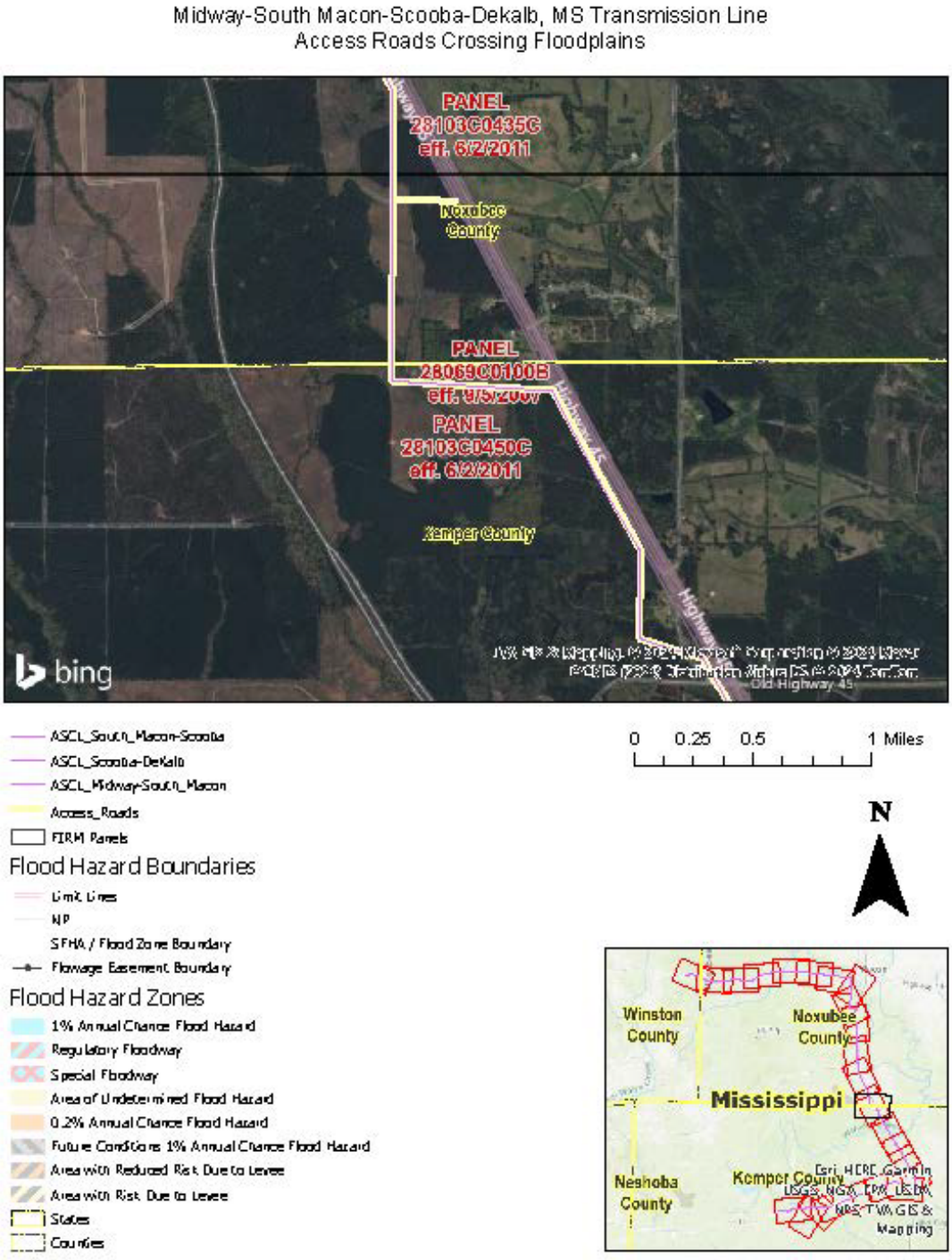

Figure D-13: Locations where the project crosses floodplains

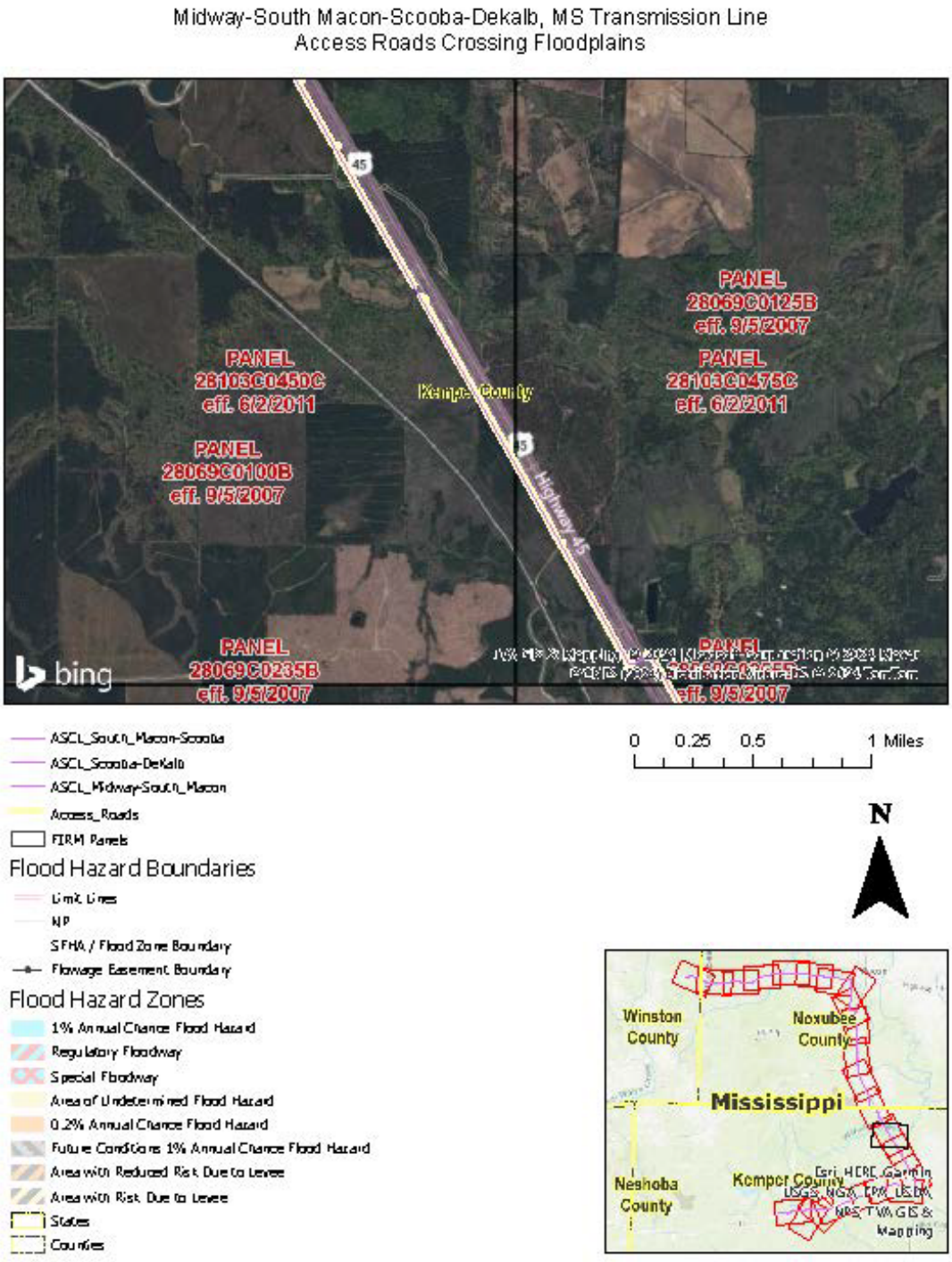

Figure D-14: Locations where the project crosses floodplains

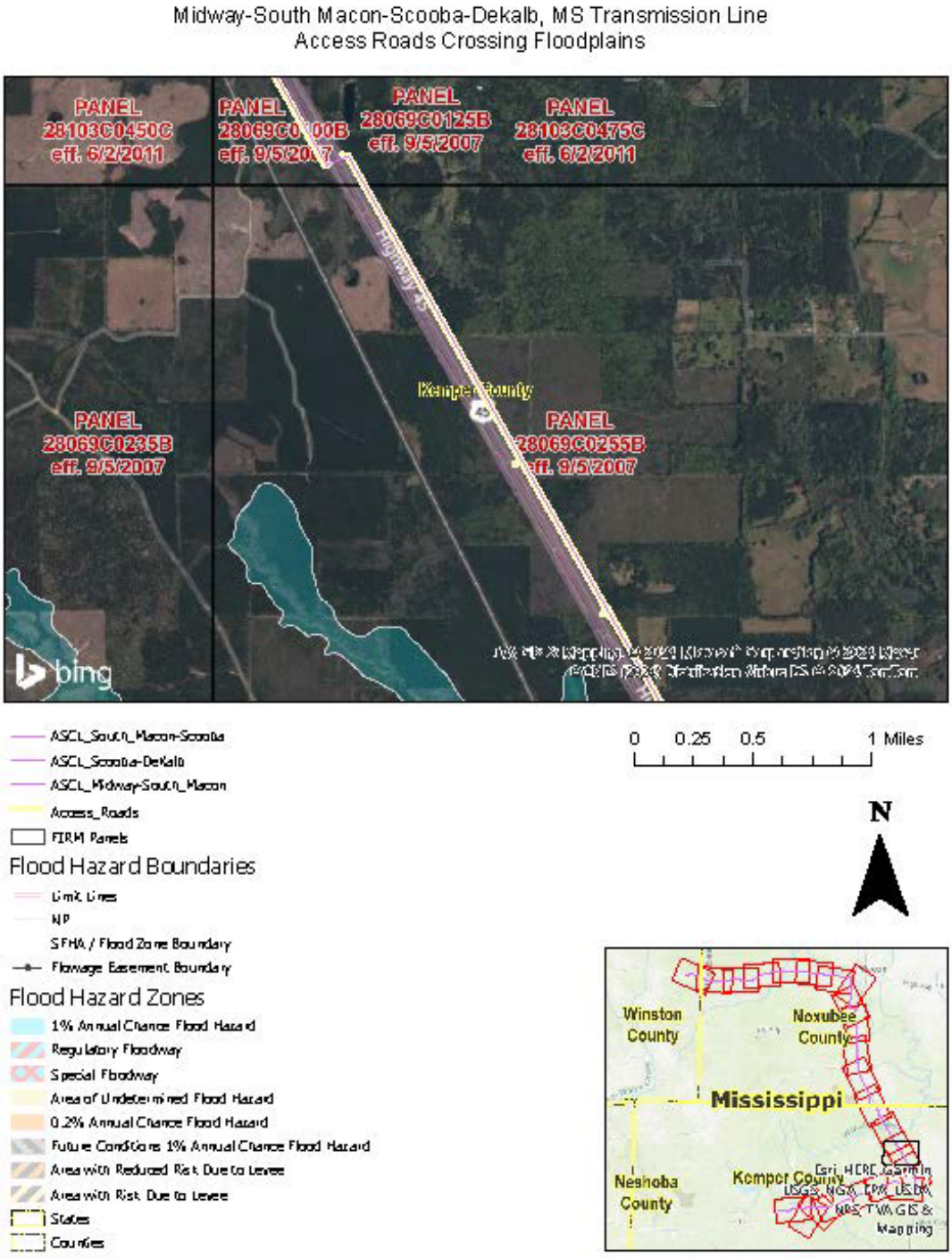

Figure D-15: Locations where the project crosses floodplains

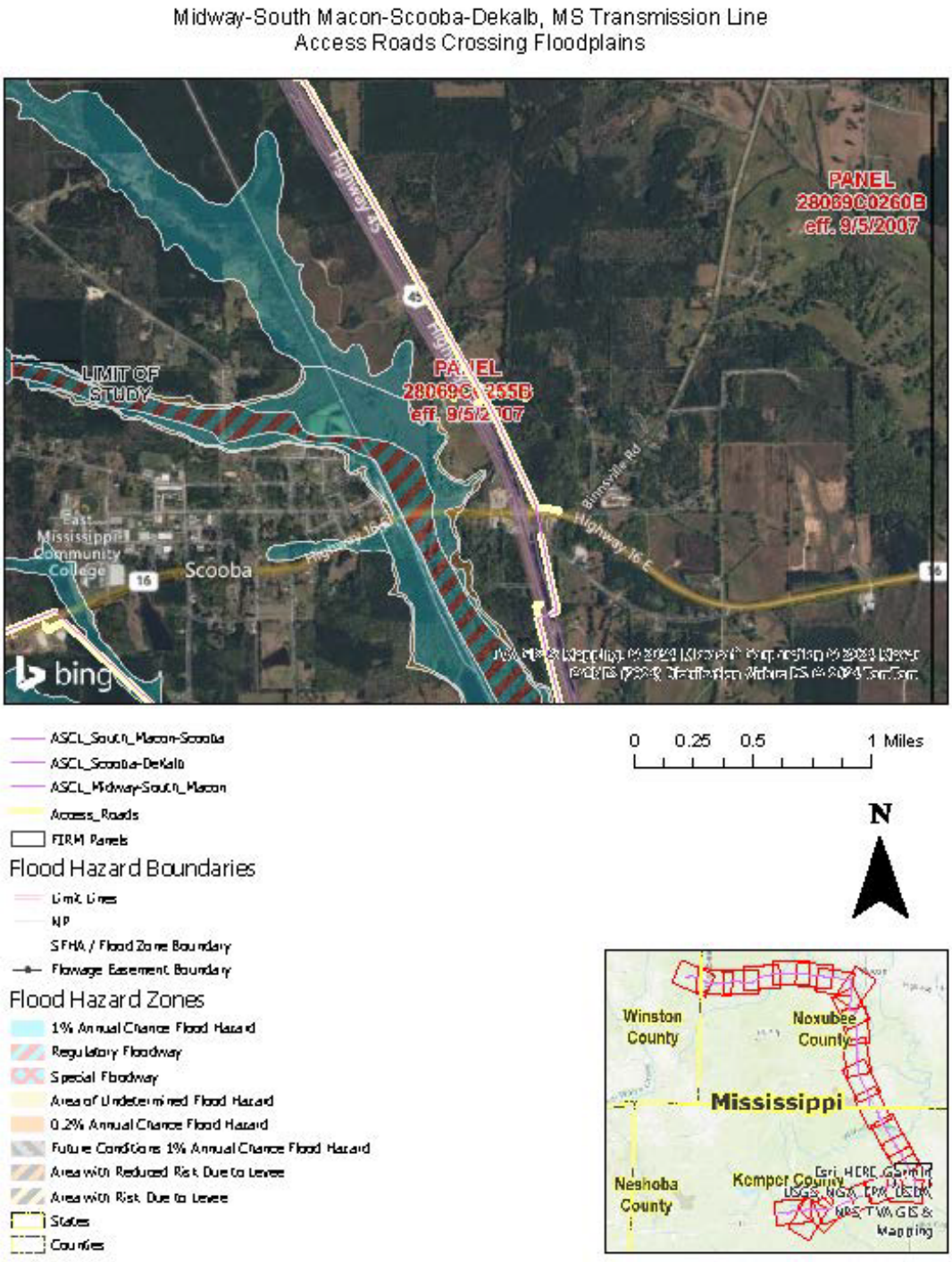

Figure D-16: Locations where the project crosses floodplains

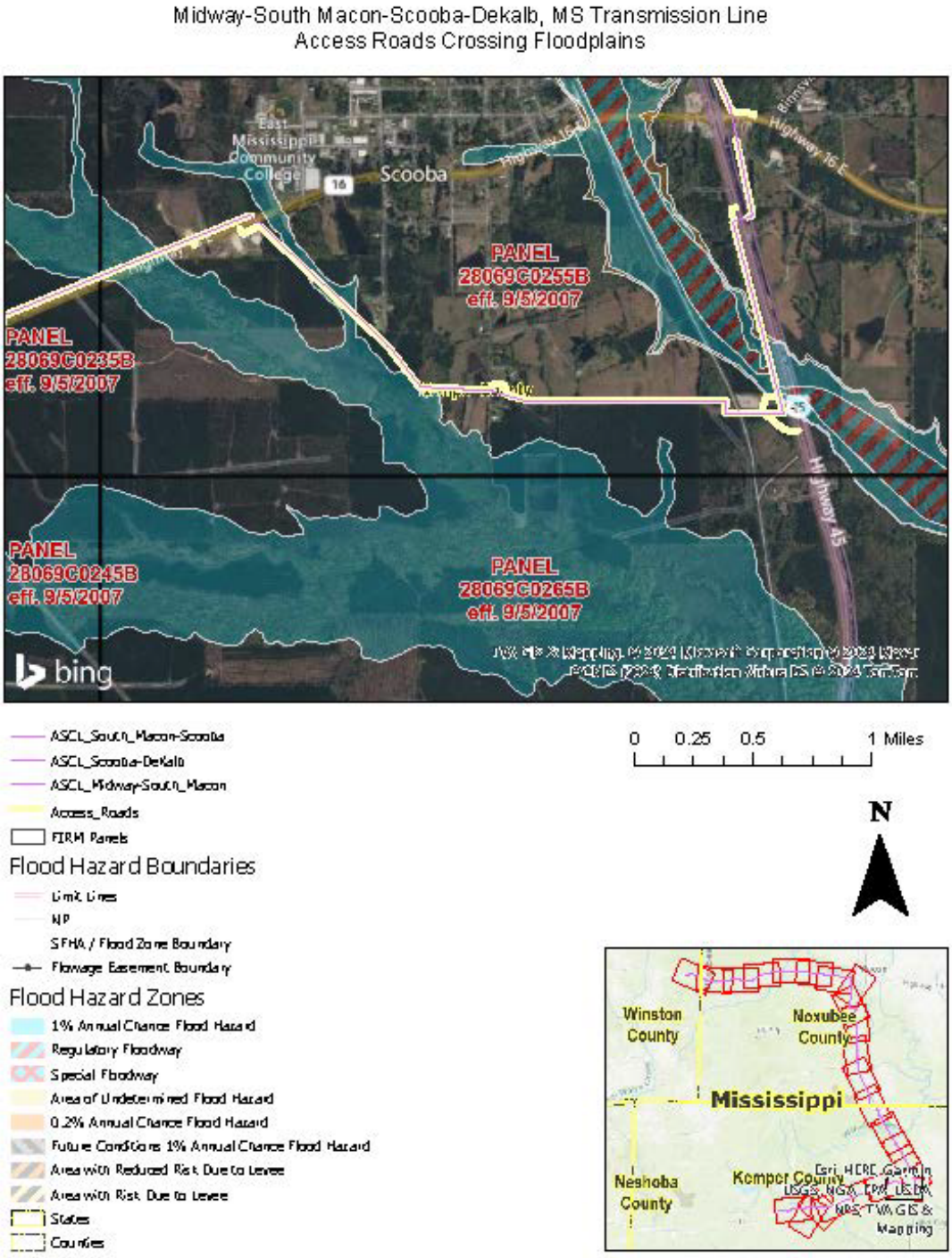

Figure D-17: Locations where the project crosses floodplains

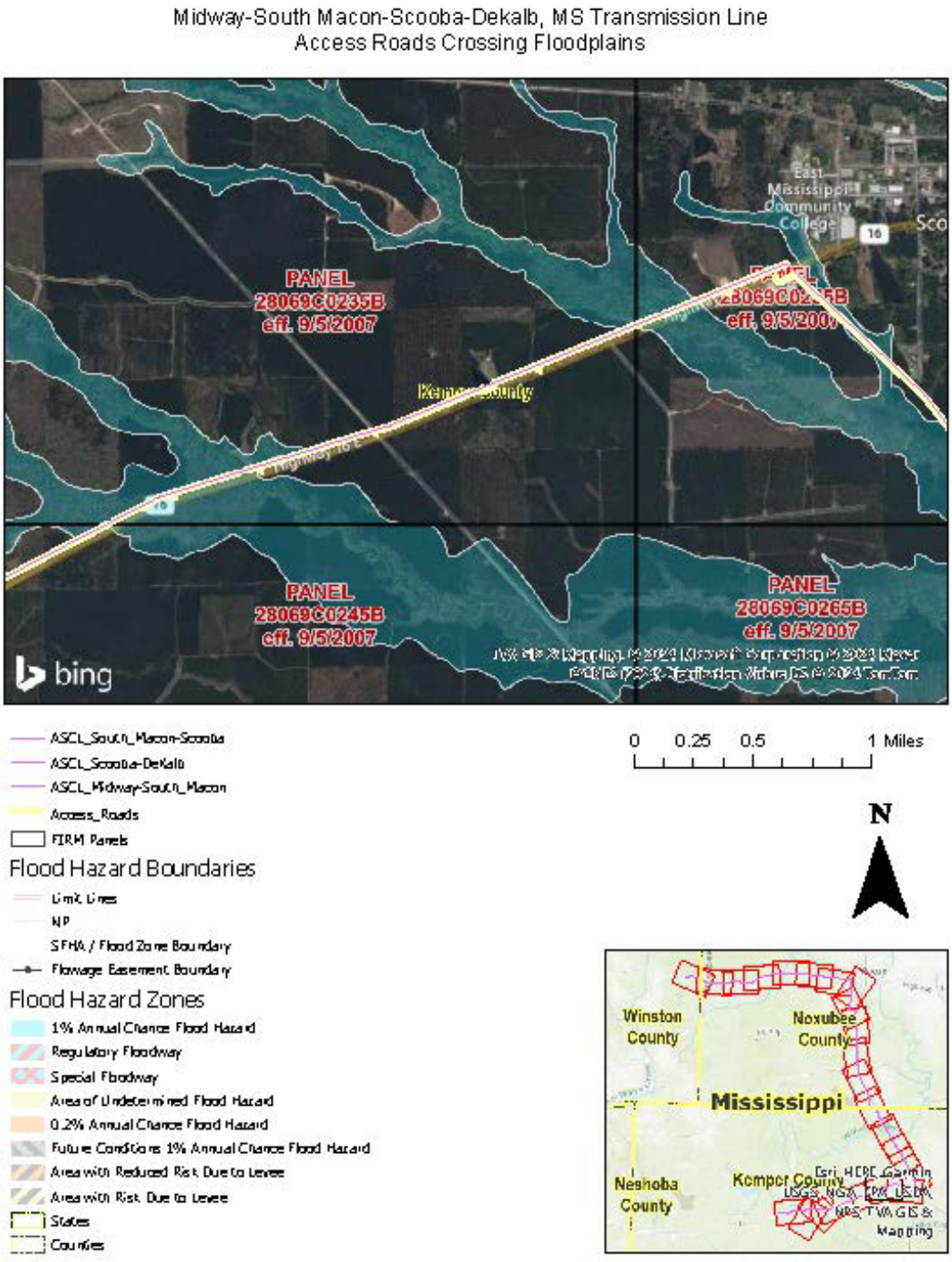

Figure D-18: Locations where the project crosses floodplains

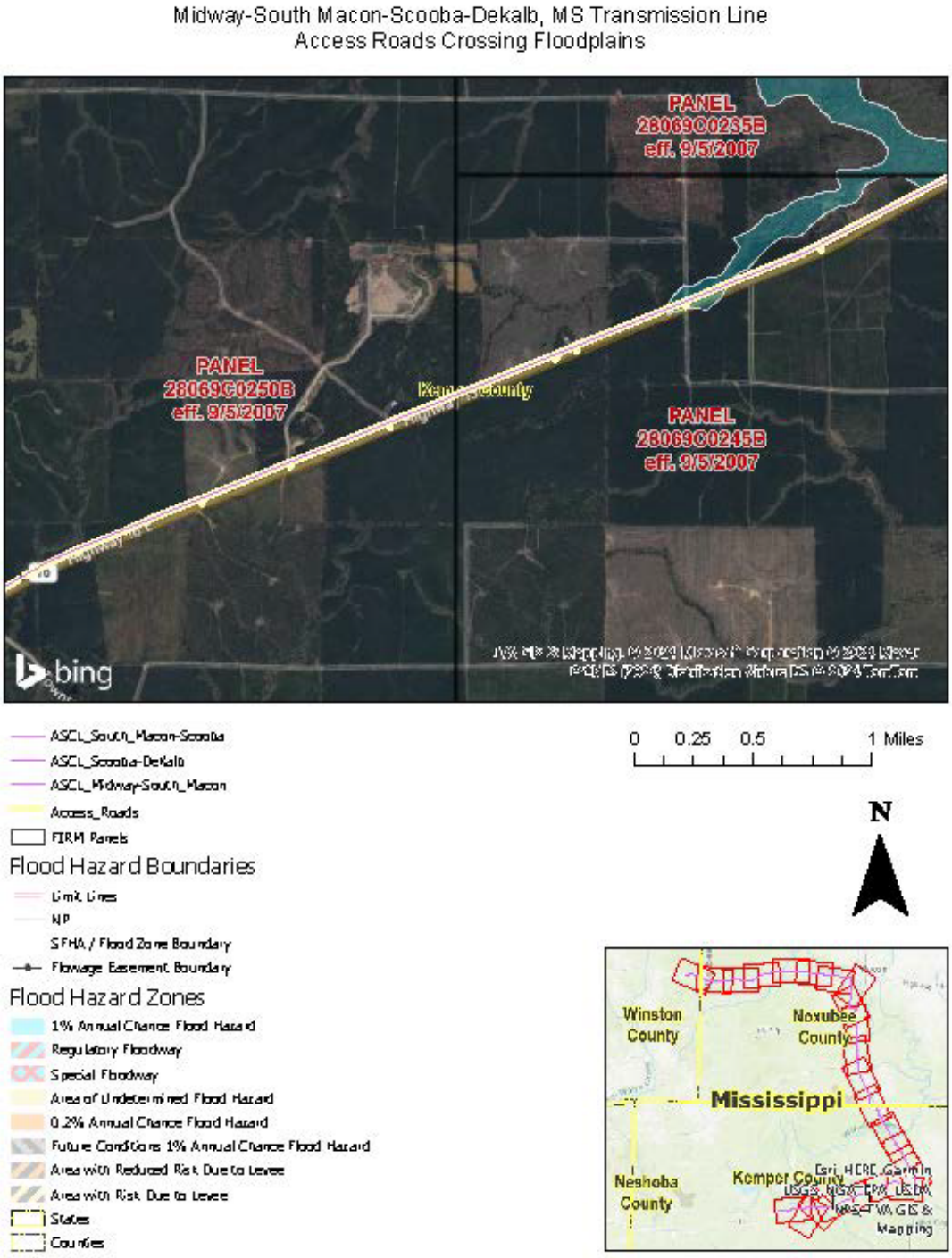

Figure D-19: Locations where the project crosses floodplains

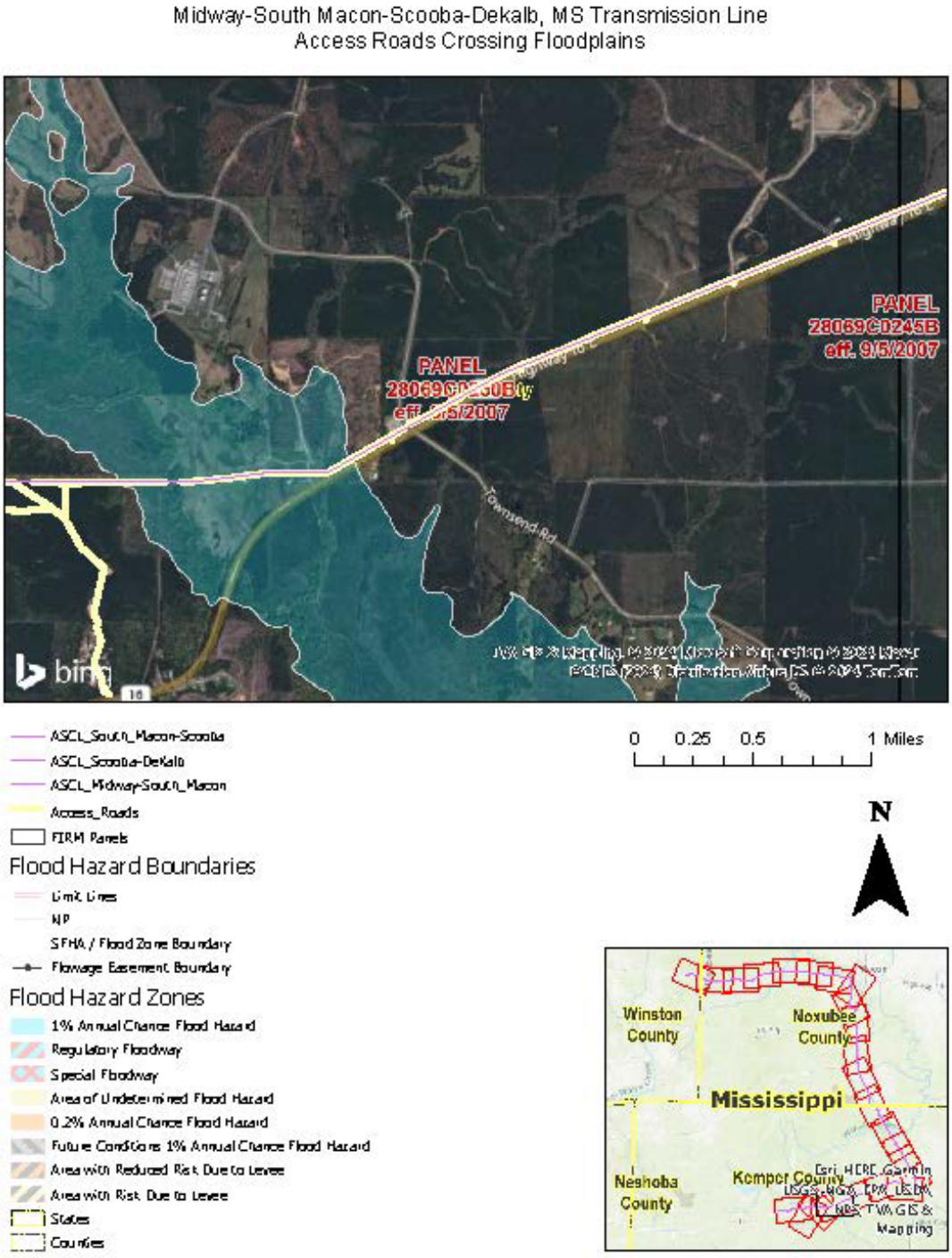

Figure D-20: Locations where the project crosses floodplains

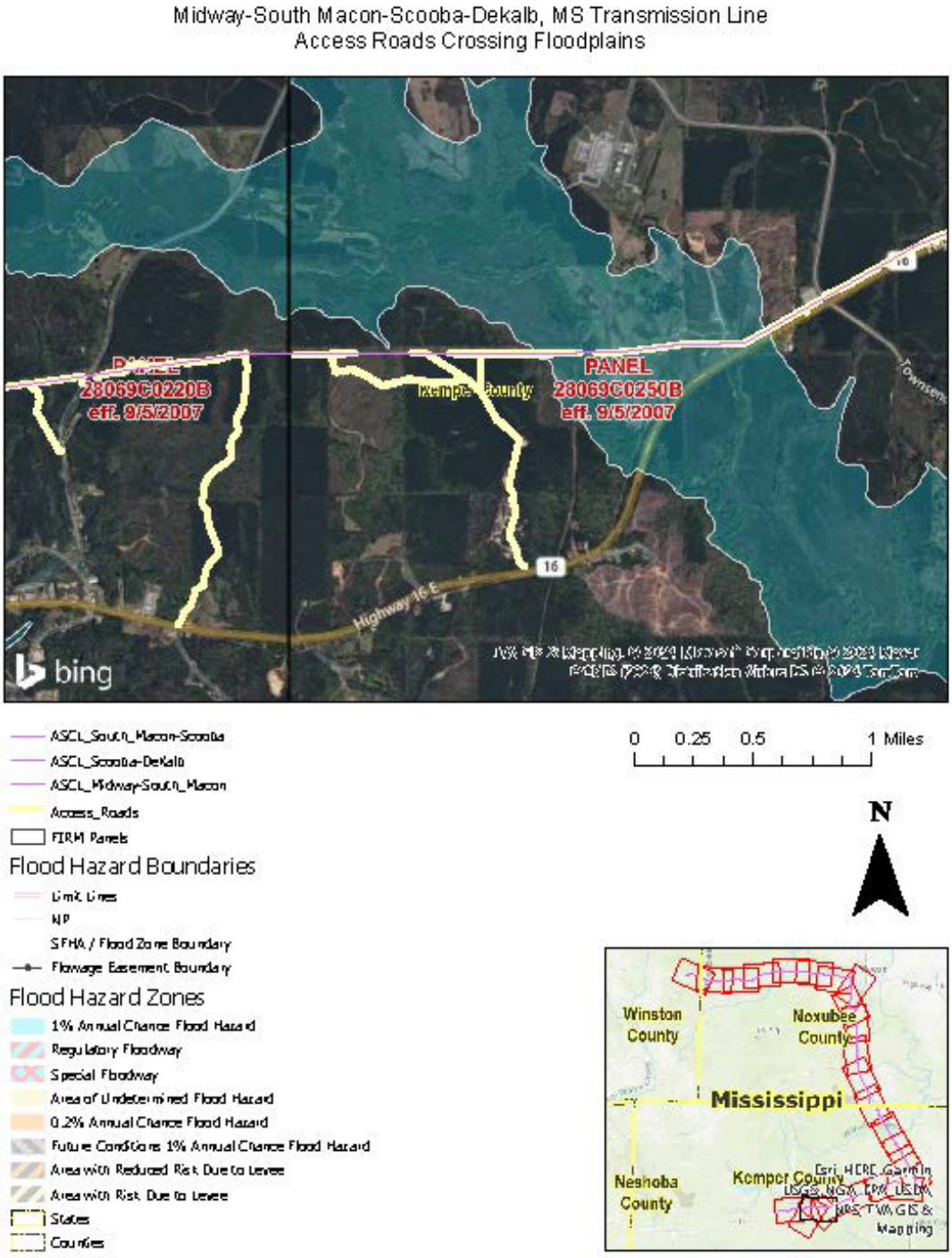

Figure D-21: Locations where the project crosses floodplains

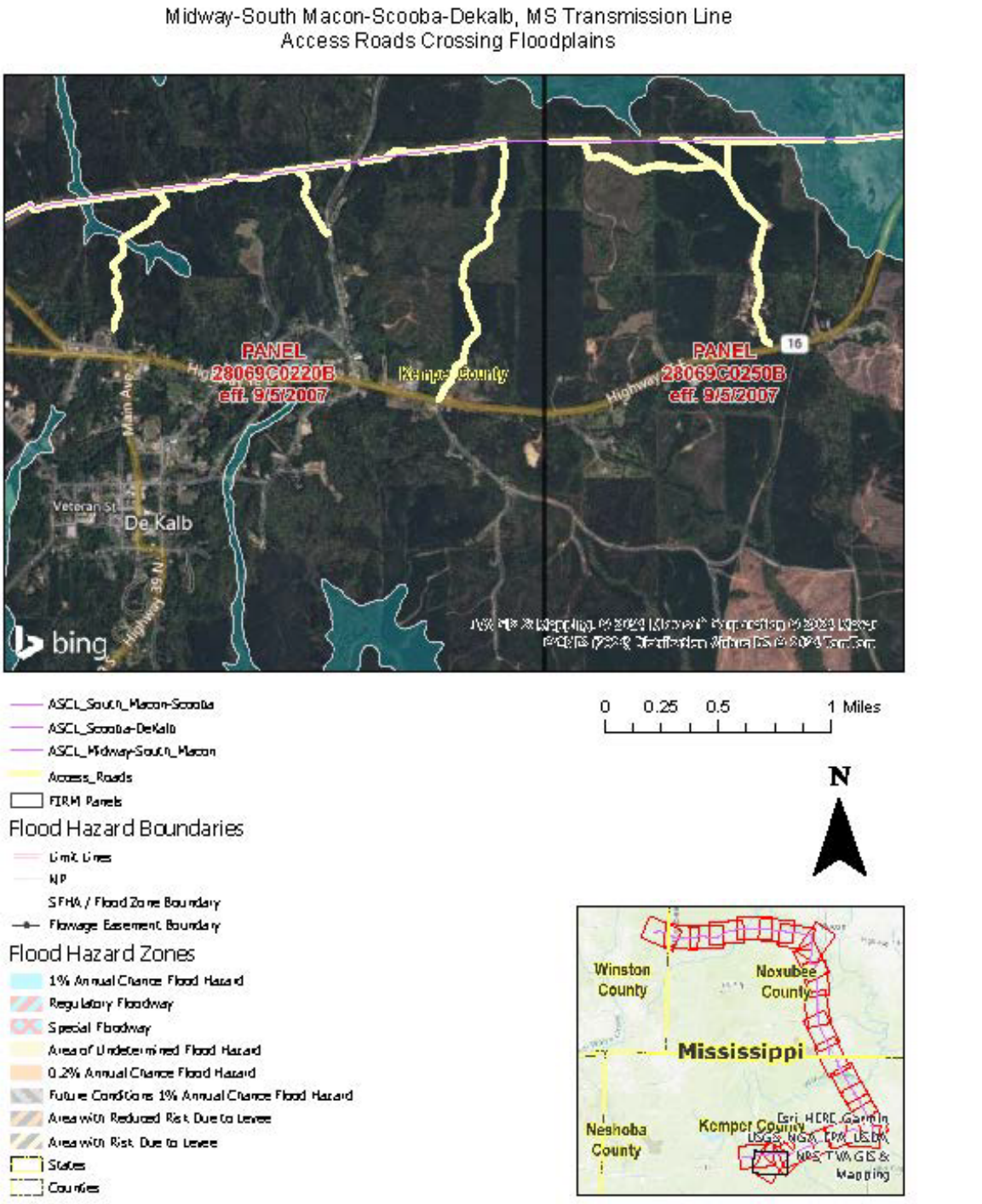

Figure D-22: Locations where the project crosses floodplains

Figure D-23: Locations where the project crosses floodplains

Midway-South Macon-Scooba-Dekalb, MS Transmission Line
Access Road Crossing Little Scooba Creek Floodway

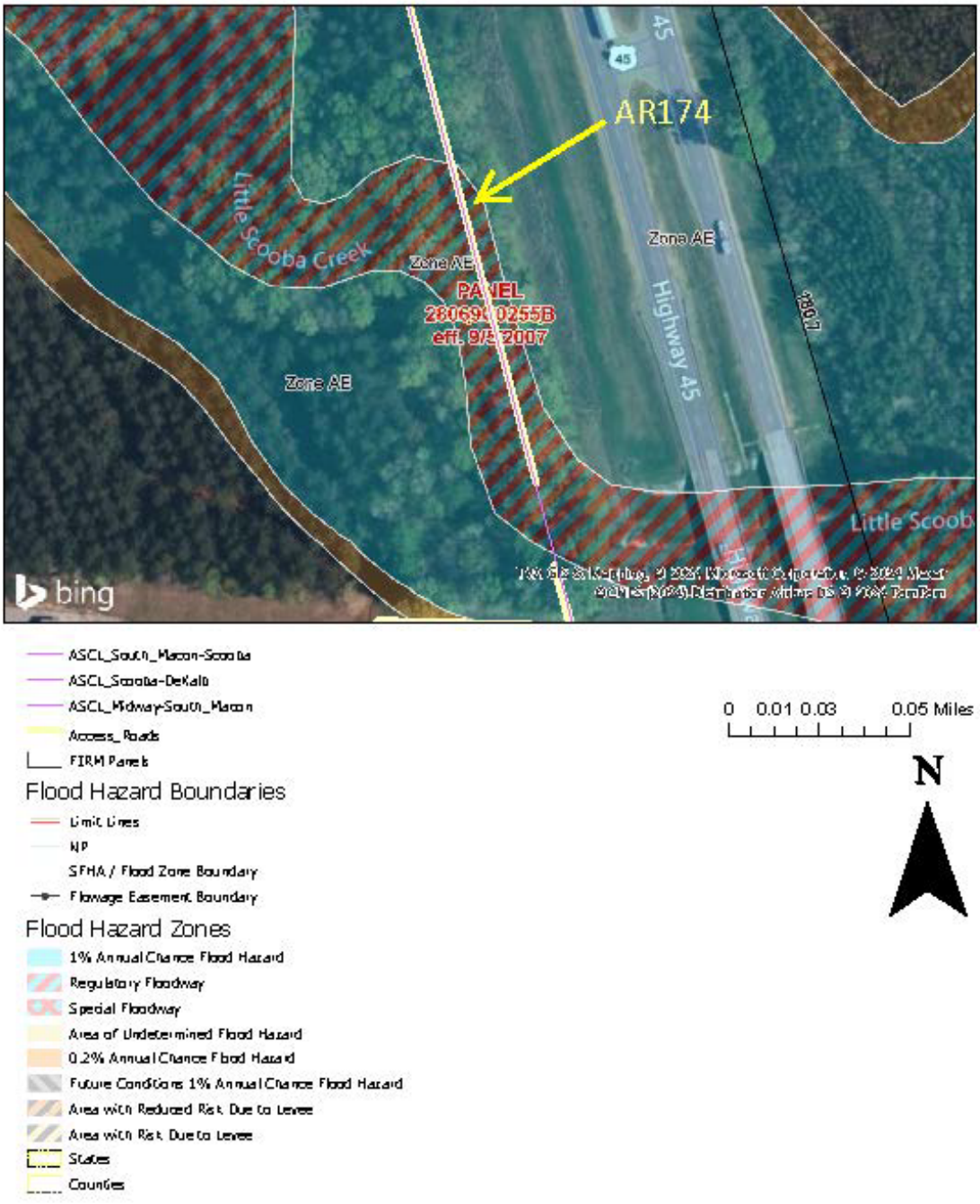

Figure FP-1: Little Scooba Creek Floodway and AR174

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Appendix E – Wetlands Along the Proposed Transmission Line and Access Roads

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Table E-1. Wetlands Located within Proposed Midway-South Dekalb-Macon Transmission Line and Associated Access Roads Project Areas

Wetland Identifier	Wetland Type[1]	TVARAM[2] Functional Capacity (Score)	Wetland Acreage in Project Area
Midway-S. Macon			
W001	PFO	51	0.64
W002	PFO	36	0.13
W003	PFO	53	0.72
W004	PFO	53	0.10
W005	PFO	36	0.26
W006	PFO	46	0.19
W007	PFO	46	0.28
W008	PFO	46	0.16
W009	PFO	46	0.78
W010	PFO	49	0.41
W011	PEM	16	0.16
W012	PEM	16	0.41
W013	PFO	49	1.19
W014	PEM	17	0.17
W015	PEM	16	0.08
W016	PFO	49	2.26
W017	PFO	41	1.63
W018	PSS	43	0.89
W019a	PFO	57	11.14
W019b	PEM	23	0.84
W020	PFO	43	0.41
W021	PFO	48	0.88
W022	PSS	46	4.79
W023	PFO	42	2.14
W024	PFO	57	3.27
W025	PFO	57	8.14
W026	PFO	57	4.30
W027	PFO	40	0.15
W028	PFO	32	0.05
W029	PEM	20	0.77
W030	PEM	26	0.18
W031R	PFO	40	0.00
W032R	PFO	45	0.00
W033R	PFO	56	0.00
W034R	PFO	NA	0.00
S. Macon-Scooba-Dekalb			
W031a	PFO	42	0.61
W031b	PEM	23	0.58
W032a	PFO	31	0.08
W032b	PEM	31	0.10
W033a	PFO	24	0.07
W033b	PEM	24	0.27
W034a	PFO	23	2.47

Wetland Identifier	Wetland Type[1]	TVARAM[2] Functional Capacity (Score)	Wetland Acreage in Project Area
W034b	PEM	28	4.31
W035	PFO	40	0.01
W036	PEM	23	0.12
W037	PEM	24	0.19
W038	PEM	30	0.00*
W039	PEM	25	0.28
W040	PFO	31	0.02
W041	PEM	29	0.07
W042	PFO	24	0.18
W043	PFO	28	0.07
W044	PEM	18	0.41
W045	PFO	25	0.36
W046	PFO	28	0.00*
W047	PFO	40	6.00
W048	PFO	33	0.61
W049	PFO	24	1.66
W050	PFO	24	1.44
W051	PFO	41	1.60
W052	PFO	39	1.05
W053	PFO	39	0.65
W054	PFO	32	0.91
W055	PFO	27	2.82
W056	PFO	33	0.29
W057	PFO	33	0.24
W058a	PEM	19	0.29
W058b	PFO	38	0.30
W059a	PFO	38	0.58
W059b	PEM	19	0.15
W060	PFO	38	1.99
W061	PEM	27	0.58
W062	PEM	19	0.43
W063	PEM	16	0.05
W064	PEM	16	0.41
W065	PEM	14	0.09
W066	PEM	21	0.62
W067	PEM	19	0.61
W068	PEM	16	1.40
W069	PEM	17	0.45
W070	PEM	21	0.11
W071	PEM	20	0.33
W072	PEM	19	0.01
W073	PEM	17	0.07
W074	PEM	21	3.38
W075	PEM	40	0.56
W076	PEM	23	0.78
W077	PEM	24	0.44
W078	PEM	18	0.14
W079	PEM	19	0.06

Wetland Identifier	Wetland Type[1]	TVARAM[2] Functional Capacity (Score)	Wetland Acreage in Project Area
W080	PEM	26	0.18
W081	PEM	24	0.07
W082	PEM	14	1.26
W083	PEM	14	1.48
W084	PEM	30	1.66
W085	PEM	39	0.30
W086	PEM	33	0.13
W087	PEM	33	0.31
W088	PEM	22	0.11
TOTAL ACRES			**94.37**

[1]Classification codes as defined in Cowardin et al. (1979): PEM=Emergent; PFO=Forested; PSS=Scrub-shrub

[2]TVARAM = Tennessee Valley Authority Rapid Assessment Method that categorizes wetland quality by their functional capacity; 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.

*No portion of the wetland is located within the ROW.

Table E-2. Action Alternative Wetlands Impacts on the proposed Midway-South Macon-Dekalb Transmission Line Project and associated access roads.

Wetland Identifier	Impact Type	Acreage of Wetland Fill	Acreage of Wooded Wetland Clearing	Acreage of temp impact to PEM wetlands along access roads and STR Installation within ROW
Midway-S. Macon				
W001	Clearing for conductor spans	0.0000	0.64	0.00
W002	Clearing for conductor spans	0.0000	0.13	0.00
W003	Clearing for conductor spans	0.0000	0.72	0.00
W004	Clearing for conductor spans	0.0000	0.10	0.00
W005	Clearing for conductor spans	0.0000	0.26	0.00
W006	Clearing for conductor spans	0.0000	0.19	0.00
W007	Clearing for conductor spans	0.0000	0.28	0.00
W008	Clearing for conductor spans, fill for TL poles	0.0002	0.16	0.00
W009	Clearing for conductor spans, fill for TL poles	0.0002	0.78	0.00
W010	Clearing for conductor spans, fill for TL poles	0.0002	0.41	0.00
W011	Temporary for access	0.0000	0.00	0.03
W012	Temporary for access	0.0000	0.00	0.07
W013	Clearing for conductor spans, fill for structures	0.0002	1.19	0.00
W014	None	0.0000	0.00	0.00
W015	Temporary for access	0.0000	0.00	0.01
W016	Clearing for conductor spans, fill for structures	0.0004	2.26	0.00
W017	Clearing for conductor spans, fill for structures	0.0004	1.63	0.00
W018	Clearing for conductor spans, fill for structures	0.0002	0.89	0.00
W019a	Clearing for conductor spans, fill for structures	0.0016	11.14	0.00
W019b	Temporary for access, fill for TL poles	0.0002	0.00	0.38
W020	Clearing for conductor spans	0.0000	0.41	0.00
W021	Clearing for conductor spans, fill for structures	0.0002	0.88	0.00
W022	Clearing for conductor spans, fill for structures	0.0008	4.79	0.00
W023	Clearing for conductor spans, fill for structures	0.0004	2.14	0.00
W024	Clearing for conductor spans, fill for structures	0.0004	3.27	0.00
W025	Clearing for conductor spans, fill for structures	0.0014	8.14	0.00
W026	Clearing for conductor spans, fill for structures	0.0008	4.30	0.00
W027	Clearing for conductor spans	0.0000	0.15	0.00

Wetland Identifier	Impact Type	Acreage of Wetland Fill	Acreage of Wooded Wetland Clearing	Acreage of temp impact to PEM wetlands along access roads and STR Installation within ROW
W028	Clearing for conductor spans	0.0000	0.05	0.00
W029	Temporary for access, fill for TL poles	0.0002	0.00	0.30
W030	Temporary for access, fill for TL poles	0.0004	0.00	0.18
W031R	Clearing for conductor spans	0.0000	0.00	0.00
W032R	Clearing for conductor spans	0.0000	0.00	0.00
W033R	Clearing for conductor spans	0.0000	0.00	0.00
W034R	Clearing for conductor spans	0.0000	0.00	0.00
S. Macon-Scooba-Dekalb				
W031a	Clearing for conductor spans	0.0000	0.61	0.00
W031b	Temporary for access	0.0000	0.00	0.22
W032a	Clearing for conductor spans	0.0000	0.08	0.00
W032b	Temporary for access	0.0000	0.00	0.06
W033a	Clearing for conductor spans	0.0000	0.07	0.00
W033b	Temporary for access	0.0000	0.00	0.06
W034a	Clearing for conductor spans	0.0000	2.47	0.00
W034b	Temporary for access, fill for TL poles	0.0012	0.00	1.67
W035	Clearing for conductor spans	0.0000	0.01	0.00
W036	Temporary for access	0.0000	0.00	0.05
W037	Temporary for access	0.0000	0.00	0.03
W038	Temporary for access	0.0000	0.00	0.00
W039	Temporary for access	0.0000	0.00	0.10
W040	Clearing for conductor spans	0.0000	0.02	0.00
W041	Temporary for access	0.0000	0.00	0.04
W042	Clearing for conductor spans	0.0000	0.18	0.00
W043	Clearing for conductor spans	0.0000	0.07	0.00
W044	Temporary for access	0.0000	0.00	0.08
W045	Clearing for conductor spans	0.0000	0.36	0.00
W046	Clearing for conductor spans	0.0000	0.00	0.00
W047	Clearing for conductor spans	0.0010	6.00	0.00
W048	Clearing for conductor spans	0.0000	0.61	0.00
W049	Clearing for conductor spans	0.0000	1.66	0.00
W050	Clearing for conductor spans, fill for structures	0.0002	1.44	0.00
W051	Clearing for conductor spans, fill for structures	0.0002	1.60	0.00
W052	Clearing for conductor spans, fill for structures	0.0002	1.05	0.00
W053	Clearing for conductor spans	0.0000	0.65	0.00
W054	Clearing for conductor spans	0.0000	0.91	0.00
W055	Clearing for conductor spans, fill for structures	0.0004	2.82	0.00

Wetland Identifier	Impact Type	Acreage of Wetland Fill	Acreage of Wooded Wetland Clearing	Acreage of temp impact to PEM wetlands along access roads and STR Installation within ROW
W056	Clearing for conductor spans	0.0000	0.29	0.00
W057	Clearing for conductor spans	0.0000	0.24	0.00
W058a	Temporary for access	0.0000	0.00	0.09
W058b	Clearing for conductor spans	0.0000	0.30	0.00
W059a	Clearing for conductor spans	0.0000	0.58	0.00
W059b	Temporary for access	0.0000	0.00	0.00
W060	Clearing for conductor spans, fill for structures	0.0002	1.99	0.00
W061	Temporary for access	0.0000	0.00	0.19
W062	Temporary for access	0.0000	0.00	0.10
W063	Temporary for access, fill for structures	0.0002	0.00	0.07
W064	Temporary for access	0.0000	0.00	0.07
W065	Temporary for access	0.0000	0.00	0.02
W066	Temporary for access, fill for structures	0.0001	0.00	0.18
W067	Temporary for access	0.0000	0.00	0.13
W068	Temporary for access, fill for structures	0.0002	0.00	0.47
W069	Temporary for access	0.0000	0.00	0.08
W070	Temporary for access	0.0000	0.00	0.06
W071	Temporary for access	0.0000	0.00	0.08
W072	Temporary for access	0.0000	0.00	0.00
W073	Temporary for access	0.0000	0.00	0.03
W074	Temporary for access, fill for structures	0.0006	0.00	1.02
W075	Temporary for access	0.0000	0.00	0.14
W076	Temporary for access, fill for structures	0.0002	0.00	0.14
W077	Temporary for access	0.0000	0.00	0.11
W078	Temporary for access	0.0000	0.00	0.02
W079	Temporary for access	0.0000	0.00	0.01
W080	Temporary for access	0.0000	0.00	0.03
W081	Temporary for access	0.0000	0.00	0.01
W082	Temporary for access, fill for structures	0.0002	0.00	0.34
W083	Temporary for access, fill for structures	0.0002	0.00	0.35
W084	Temporary for access, fill for structures	0.0002	0.00	0.64
W085	Temporary for access	0.0000	0.00	0.00
W086	Temporary for access	0.0000	0.00	0.00
W087	Temporary for access	0.0000	0.00	0.02
W088	Temporary for access	0.0000	0.00	0.02

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Appendix F – Noise During Transmission Line Construction and Operation

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Appendix F - Noise During Transmission Line and Substation Construction and Operation

At high levels, noise can cause hearing loss; at moderate levels, noise can interfere with communication, disrupt sleep, and cause stress; and at low levels, noise can cause annoyance. Noise is measured in decibels (dB), a logarithmic unit, so an increase of 3 dB is just noticeable, and an increase of 10 dB is perceived as a doubling of sound level. Because not all noise frequencies are perceptible to the human ear, A-weighted decibels (dBA), which filter out sound in frequencies above and below human hearing, are typically used in noise assessments.

Both the U.S. Environmental Protection Agency (EPA) and the Department of Housing and Urban Development (HUD) have established noise guidelines. EPA guidelines are based on an equivalent day/night average sound level (DNL), which is a 24-hour average sound level with 10 dB added to hours between 10 p.m. and 7 a.m., since people are more sensitive to nighttime noise. USEPA recommends a guideline of DNL less than 55 dBA to protect the health and well-being of the public with an adequate margin of safety. HUD guidelines use an upper limit DNL of 65 dBA for acceptable residential development and an upper limit DNL of 75 dBA for acceptable commercial development. TVA generally uses the USEPA guideline of 55 dBA DNL at the nearest residence and 65 dBA at the property line in industrial areas to assess the noise impact of a project. In addition, TVA considers the Federal Interagency Committee on Noise (FICON) 1992 recommendation that a 3-dB increase indicates possible impact, requiring further analysis when the existing DNL is 65 dBA or less.

Annoyance from noise is highly subjective. The FICON used population surveys to correlate annoyance and noise exposure (FICON 1992). Table F-1 gives estimates of the percentage of typical residential populations that would be highly annoyed from a range of background noise and the average community reaction description that would be expected.

Table F-1. Estimated Annoyance from Background Noise (FICON 1992)

Day/Night Level (dBA)	Percent Highly Annoyed	Average Community Reaction
75 and above	37	Very severe
70	25	Severe
65	15	Significant
60	9	Moderate
55 and below	4	Slight

For comparative purposes, typical background DNLs for rural areas range from about 40 dBA in undeveloped areas to 48 dBA in mixed residential/agricultural areas (Cowan 1993). Noise levels are typically higher in higher-density residential and urban areas. Background noise levels greater than 65 dBA can interfere with normal conversations, requiring people to speak in a raised voice to carry on a normal conversation.

Construction Noise

Construction noise impacts would vary with the number and specific types of equipment on the job, the construction methods, the scheduling of the work, and the distance to sensitive noise receptors such as houses. Typical construction activities for a transmission line are described in Section 2.2. Maximum noise levels generated by the various pieces of construction equipment typically range from about 70 to 85 dBA at 50 feet (Bolt et al. 1971). An exception would be the use of track drills for building roads and installing foundations in rocky areas; track drills have a typical maximum noise level of 98 dBA at 50 feet. Use of track drills is not expected to be widespread.

Project-related construction noise levels would likely exceed background noise levels by more than 10 dBA at distances from within 500 feet in developed areas to over 1,000 feet in rural areas with little development. These distances are without the use of track drills; drilling activities could increase the distances by an additional 500 feet. A 10-dBA increase would be perceived as a large increase over the existing noise level and could result in annoyance to adjacent residents. The residential noise level guideline of 55 dBA could also be temporarily exceeded for residences near construction activities.

Construction activities would be limited to daylight hours. Because of the sequence of construction activities, construction noise at a given point along the transmission line connections would be limited to a few periods of a few days each. The temporary nature of construction would reduce the duration of noise impacts on nearby residents.

Operational Noise

Transmission lines can produce noise from corona discharge, which is the electrical breakdown of air into charged particles. Corona noise is composed of both broadband noise, characterized as a crackling noise, and pure tones, characterized as a humming noise. Corona noise is greater with increased voltage and is also affected by weather. It occurs during all types of weather when air ionizes near irregularities, such as nicks, scrapes, dirt, and insects on the conductors. During dry weather, the noise level is low and often indistinguishable off the ROW from background noise. In wet conditions, water drops collecting on the conductors can cause louder corona discharges.

For 500-kV transmission lines, this corona noise when present, is usually about 40-55 dBA. The maximum recorded corona noise has been 60-61 dBA (TVA unpublished data). During rain showers, the corona noise would likely not be readily distinguishable from background noise. During very moist, non-rainy conditions, such as heavy fog, the resulting small increase in the background noise levels is not expected to result in annoyance to adjacent residents.

Periodic maintenance activities, particularly vegetation management, would produce noise comparable to that of some phases of transmission line construction. This noise, particularly from bush-hogging or helicopter operation, would be loud enough to cause some annoyance. It would, however, be of very short duration and very infrequent occurrence.

Literature Cited – Appendix F – Noise During Transmission Line Construction and Operation

Bolt, Beranek, and Newman Inc. 1971. Noise From Construction Equipment and Operations, Building Equipment, and Home Appliances. U.S. Environmental Protection Agency Report NTID300.1. Protection Agency Report NTID300.1.

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