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FINAL ENVIRONMENTAL ASSESSMENT

FIVE POINTS-HOMEWOOD 161-KV TRANSMISSION LINE

Scott County, Mississippi

TENNESSEE VALLEY AUTHORITY

MARCH 2006

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CHAPTER 1

1. PURPOSE OF AND NEED FOR ACTION

1.1. Proposed Action

The Tennessee Valley Authority (TVA) proposes to build a new 161-kilovolt (kV) transmission line that would interconnect the TVA transmission system with the Southern Mississippi Electric Power Association (SMEPA) power system. This interconnection would be completed by 2007. This new line would consist of two sections. The first section, which would be approximately 6 miles long, would be built on new right-of-way from the Five Points Substation to a point near Lake, Mississippi (see Figure 1). The Five Points Substation is owned by the Central Electric Power Association (CEPA). The second section would extend from a point near Lake, Mississippi, to SMEPA's Homewood Substation. This second section would be 11.5 miles long and would be built on existing SMEPA right-of-way currently occupied by a 69-kV transmission line. On this segment, TVA proposes to construct a new 161-kV transmission line and rebuild the 69-kV line. These two lines would share new structures.

In addition, as part of the proposed action, metering and communications changes and additions would be made at TVA's Philadelphia 161-kV Substation, Tupelo 161-kV Substation, a repeater station near Forest, Mississippi, and the Power Business Center in Chattanooga, Tennessee. This work would consist primarily of the installation of new electronic equipment and wiring changes within the existing facilities. Thus, these changes would not have any effect on the environment locally or regionally.

1.2. Objectives of the Five Points-Homewood 161-kV Project

TVA's lower Mississippi service area is supplied with power via three long transmission lines (72, 86, and 106 miles, respectively) that connect the West Point Substation south to the Philadelphia Substation. At the Philadelphia Substation, the transmission lines turn west, forming a "figure 8" through the Leake and Sebastopol Substations then on to the Langford Substation, which is located east of Jackson. TVA recently built a 161-kV transmission line from the Sebastopol Substation to serve the Five Points Substation.

TVA's Kemper Combustion Turbine Plant, a four-unit, 340-megawatt peaking generator located south of Starkville and Columbus, is operated as much as possible to supply the critical power generation support for the region. However, another source of backup power is needed in order to avoid potential customer power outages. These outages would likely occur if one of the transmission lines into Philadelphia were to fail during a period of heavy power demand while the Kemper generators were not running.

The new transmission line from the Five Points Substation to the Homewood Substation would be about 17 miles long and would provide voltage support for the area. With the proposed line in place, there would be a source of backup power to help avoid potential customer power outages. The new line would also provide an interconnection in an area where TVA has none.

1.3. Other Pertinent Environmental Reviews or Documentation

Addition of Electric Generation Peaking Capacity at Greenfield Sites, Mississippi, Final Environmental Impact Statement. Tennessee Valley Authority, March 2001. [#628]

Leake-Sebastopol-Five Points 161-kV Transmission Line, Sebastopol, MS 161-kV Switching Station and Associated Connections Final Environmental Assessment. Tennessee Valley Authority Transmission and Power Supply, Siting and Environmental Design Department, July 2002. [#795]

Red Hills Power Project Final Environmental Impact Statement. Tennessee Valley Authority, July 1998. [#386]

1.4. Decisions

The decision before TVA is whether to build a new 161-kV transmission line to interconnect to SMEPA. If the interconnection were built, other specific decisions would include:

- The timing of the improvement
- The best route for a transmission line
- Appropriate mitigation and/or monitoring measures to implement in order to meet TVA standards and minimize potential adverse environmental effects

1.5. The Scoping Process

The following federal, state, and local agencies and other organizations have been contacted by TVA concerning this project.

- Board of Supervisors, Scott County, Mississippi
- Mississippi Department of Archives and History
- Mississippi Department of Environmental Quality
- U.S. Congressmen from the study area
- U.S. Fish and Wildlife Service
- U.S. Forest Service

TVA held a public meeting in Lake, Mississippi, on December 2, 2004. At that meeting, TVA presented two potential corridor alternatives for the portion of the project that would be located on new right-of-way (see Figure 2). Public officials and about 300 potentially affected property owners within these corridors were specifically invited, and newspaper advertisements invited any interested public as well. TVA issued a news release to local news outlets. Total attendance at the meeting was 60.

During a 30-day public comment period following the open house, TVA accepted public comments on potential line routes and other issues. A toll-free phone number and facsimile number were made available to facilitate comments.

This proposal was reviewed for consistency with Executive Order (EO) 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), Farmland Protection Policy Act, National Historic Preservation Act (NHPA), Endangered Species Act, Section 404 of the Clean Water Act, EO 12372 (Intergovernmental Review), and EO 12898 (Environmental Justice).

1.6. Necessary Federal Permits or Licenses

Permits would be required from the state of Mississippi for construction site storm water discharge for the transmission line construction. TVA's Transmission Construction organization would prepare the required erosion and sedimentation control plans and coordinate these plans with the appropriate state and local authorities in order to secure all necessary permits.

CHAPTER 2

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A description of the various alternatives considered is provided in this chapter. Additional background information about transmission line construction, operation, and maintenance is also provided. This chapter contains the following seven major sections:

- Description of Alternatives
- Alternatives Eliminated From Detailed Study
- Description of Construction, Operation, and Maintenance of the Proposed 161-kV Transmission Line
- Project and Siting Alternatives
- Identification of the Preferred Route Segment
- Comparison of Alternatives
- The Preferred Alternative

2.1. Description of Alternatives

Besides a No Action Alternative, one feasible Action Alternative was developed. The alternatives are described below.

2.1.1. Alternative A – The No Action Alternative (Do Not Build Additional Transmission Facilities)

Under this alternative, TVA would not construct the new transmission line. As a result, the transmission system in east central Mississippi would continue to operate with a high-risk level of interruption in certain situations. This risk would likely increase over time as the electrical loads in the area grow.

2.1.2. Alternative B – Construct 161-kV Transmission Line – Five Points to Homewood

Under this alternative, TVA would construct a new approximately 6-mile-long 161-kV transmission line from the Five Points Substation to a point near Lake, Mississippi. Beginning at this point, TVA would rebuild an existing 11.5-mile segment of 69-kV and 161-kV transmission line to the Homewood Substation. This second segment would contain two lines mounted on the same structures. TVA would be responsible for maintaining the right-of-way for the new line segment from the Five Points Substation to the edge of the SMEPA service area, which is east of Lake (see Figure 1, sheet 2). SMEPA would have right-of-way maintenance responsibility for that portion of the new line within its service area. Because the rebuilt segment is part of a SMEPA-owned transmission line, SMEPA would continue to maintain the right-of-way on that line segment.

New electronic equipment would be installed and minor changes would be made to wiring systems within existing facilities at the Philadelphia 161-kV Substation, the Tupelo 161-kV Substation, the SIV Repeater Station, and the Power Business Center in Chattanooga, Tennessee (see Section 1.1). These actions are necessary to provide remote control and monitoring of the proposed changes to the TVA transmission system.

2.2. Alternatives Eliminated from Detailed Study

Three additional options were considered. However, they were determined to be impractical and were eliminated from further study. These three alternatives are summarized below.

2.2.1. Construct 161-kV Transmission Line – Red Hills to Leake

This option would involve the construction of a new 161-kV transmission line from the Red Hills Generating Plant near Ackerman, Mississippi, to the Leake Substation located near Carthage, Mississippi. This line would require new, 100-foot-wide right-of-way and would be between 40 and 45 miles in length. This alternative was eliminated from further study because it would be very expensive to implement, and it would present the potential for increased environmental effects as compared to Alternative B.

2.2.2. Change Kemper Generator Operation

This option would involve operating the Kemper combustion turbine generation as base-loaded units rather than as peaking units. Implementing this strategy would incur greatly increased operational costs. In addition, during any forced plant outage, the power reliability problem would remain. Operating permit conditions limit the hours of operation of the Kemper facility. Thus, this alternative was eliminated from further study.

2.2.3. Construct 500-kV Substation and Transmission Line – Leake 500-kV Substation and Choctaw to Leake Transmission Line

This alternative calls for building a new 500-kV substation near Leake, Mississippi, as well as the construction of a new 500-kV transmission line from the Choctaw Switching Station near Ackerman, Mississippi, to the new substation. New lower-voltage connections would also be needed from the 500-kV substation to the existing TVA system. The new line would be constructed on new right-of-way 175 feet in width and would be between 40 and 45 miles in length. The new substation would require 40 to 70 acres. This alternative was eliminated from further study based on the much greater expense and potential for increased environmental effects compared to Alternative B.

2.3. Description of Construction, Operation, and Maintenance of the Proposed 161-kV Transmission Line

2.3.1. Transmission Line Construction

2.3.1.1. Structures and Conductors

The proposed 161-kV transmission line connection from Five Points to the interconnection point with the SMEPA line would be built primarily using single-steel poles similar to those shown in Figure 3. Pole height would vary according to the terrain and would average between 80 and 90 feet.

The section of line that would accommodate both new 161-kV circuit and the 69-kV circuit would be built using single-concrete poles. The higher-voltage circuits would be at the top of the pole as shown in Figure 3, and the 69-kV lines would be placed lower on the pole. Pole height would vary with terrain but would be somewhat taller than the single-circuit section, ranging up to about 120 feet tall.

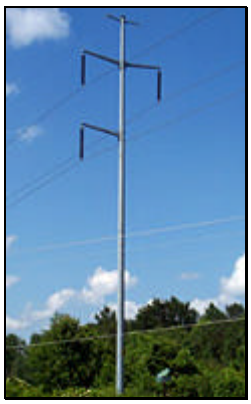

Figure 3. Single-Pole 161-kV Transmission Structure

Three conductors (the cables that carry the electrical current) are required to make up a circuit in alternating current transmission lines. For 161-kV transmission lines, each conductor is made up of a single cable. The conductors are attached to fiberglass or ceramic insulators suspended from the structure cross arms. A smaller overhead ground wire is attached to the top of the structures. This ground wire may contain fiber optic communication cables.

Poles at angles in the line may require supporting guys. Some structures for larger angles could require two or three poles. Most poles would be imbedded directly into holes augured into the ground to a depth equal to 10 percent of the pole's length plus an additional 2 feet. The holes would normally be backfilled with the excavated material. In some cases, gravel or a cement-gravel mixture might be used. Some structures may be self-supporting (i.e., non-guyed) poles fastened to a concrete foundation that is formed and poured into an excavated hole.

Equipment used during the construction phase includes trucks, truck-mounted augers, and drills, as well as tracked cranes and bulldozers.

2.3.1.2. Right-of-Way Acquisition and Clearing

New right-of-way would be needed for the transmission lines. The right-of-way for the 161-kV line would be 100 feet wide from the substation to the intersection with SMEPA. The remainder of the line would be built on existing right-of-way, which is also 100 feet wide.

Because of the need to maintain adequate clearance between tall vegetation and transmission line conductors, as well as to provide access for construction equipment, most trees and shrubs would be removed from the entire width of the right-of-way. Equipment used during this right-of-way clearing includes chain saws, skidders, bulldozers, and/or feller-bunchers. 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 right-of-way to serve as sediment barriers. Vegetation removal in streamside management zones (SMZs) and wetlands would be restricted to trees tall enough, or with the short-term potential to grow tall enough, to interfere with conductors. Clearing in SMZs would be accomplished using hand-held equipment or remote-handling equipment such as a feller-buncher in order to limit ground disturbance. TVA *Right-of-Way Clearing Specifications*, *Environmental Quality*

Protection Specifications for Transmission Line Construction, and *Transmission Construction Guidelines Near Streams* are included in Appendices A, B, and C.

Any trees located off the right-of-way that are tall enough to pass within 5 feet of a 161-kV conductor or structure (if it were to fall toward the line) are designated “danger trees” and would be removed.

Subsequent to clearing and construction, vegetative cover on the right-of-way would be restored as much as is possible to its state prior to construction. Wooded areas would be restored using native grasses and other low-growing species. Erosion controls would remain in place until the plant communities become fully established. Streamside areas would be revegetated according to TVA guidelines as described in Section 4.12, Summary of TVA Commitments and Proposed Mitigation Measures.

2.3.1.3. Access Roads

Permanent access roads would be needed to allow vehicle access to each structure and other points along the right-of-way. Twelve access roads were identified along the proposed transmission line and were included in the environmental field review. TVA would obtain the necessary rights for these access roads from landowners. The identified roads are primarily existing roads that include privately built farm and field roads. Some of these access roads may need upgrading. Upgrading would consist of minor grading and placement of gravel.

Typically, access roads used for transmission lines are located on the right-of-way wherever possible and designed to avoid severe slope conditions and to minimize the need for stream crossings. Access roads are typically about 20 feet wide and are surfaced with dirt 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 wet-weather conveyances (i.e., streams that run only following a rainfall), they 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, new temporary access roads would be restored to previous conditions. Additional applicable right-of-way clearing and environmental quality protection specifications are listed in Appendices A and B.

2.3.1.4. Construction Assembly Areas

A construction assembly area would be required for worker assembly, vehicle parking, and material storage. The area is located adjacent to the Five Points Substation site (see Figure 1). The area would be graveled and fenced, and trailers used for material storage and office space would be parked on the areas. Following the completion of construction activities, all trailers, unused materials, and construction debris would be removed from the site.

2.3.1.5. Conductor and Ground Wire Installation

Reels of conductor and ground wire would be delivered to various staging areas along the right-of-way. Temporary clearance poles would be installed at road and railroad crossings to reduce interference with traffic. A small rope would be pulled from structure to structure. It 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.

2.3.2. Operation and Maintenance

2.3.2.1. Inspection

Periodic inspections of 161-kV transmission lines are performed from the ground and by aerial surveillance using a helicopter. These inspections are conducted to locate damaged conductors, insulators, or structures, and to report any abnormal conditions that might hamper the operation of the line or adversely impact the surrounding area. During these inspections, the condition of vegetation within and immediately adjoining the right-of-way is noted. These observations are then used to plan corrective maintenance or routine vegetation management. The portion of the line located within the SMEPA service area would be owned, inspected, and maintained by SMEPA.

2.3.2.2. Vegetation Management

Management of vegetation along the right-of-way would be necessary to ensure access to structures and to maintain an adequate distance between transmission line conductors and vegetation. Management of vegetation along the right-of-way would consist of two different activities, specifically, the felling of “danger trees” adjacent to the cleared right-of-way and the control of vegetation within the cleared right-of-way.

Management of vegetation within the cleared right-of-way would use an integrated vegetation-management approach designed to encourage low-growing plant species and discourage tall-growing plant species. A vegetation reclearing plan would be developed for each transmission line segment based on the results of the periodic inspections described above. Given the land use in the area of this project, right-of-way maintenance is expected to be minimal. 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 right-of-way and mechanical mowing is not practical. Herbicides would be applied selectively from the ground with backpack sprayers or vehicle-mounted sprayers.

Any herbicides used would be applied in accordance with applicable state and federal laws and regulations and the commitments listed in this document. Only herbicides registered with the United States Environmental Protection Agency (USEPA) would be used. Appendix D contains a list of the herbicides and adjuvants (ingredients added to the herbicide solution to increase its effectiveness) currently used by TVA in right-of-way management. This list may change over time as new herbicides are developed or new information on presently approved herbicides becomes available.

Other than vegetation management, only minor maintenance work would normally be required. The transmission line structures and other components typically last several decades. In the event that a structure must be replaced, it would normally be lifted out of the ground by crane-like equipment, and the replacement structure would be inserted into the same hole or in an immediately adjacent hole.

2.4. Project and Siting Alternatives

The preferred alternative involves a new transmission line from CEPA's Five Points Substation, located northwest of Lake, Mississippi, to the SMEPA Homewood Substation, south of Forest, Mississippi. At one end, the new line would connect to a pull-off structure to be built in the Five Points Substation. A pull-off structure is a fixed structure located at the end of a transmission line designed to maintain the tension on the line while allowing a connection to the substation. At the other end, the line would connect to an existing transmission line pull-off structure to be made available in the Homewood Substation.

The town of Lake is just beyond the edge of TVA's and CEPA's service territory. SMEPA serves the area beyond TVA, and SMEPA would own any new transmission lines to be built for this project within its service territory.

Land in the study area is about evenly divided between forest and open pastureland. Several large chicken houses dot the area, and residences are sparsely distributed along the few roads in the region. Property in this vicinity is laid out on a sectionalized grid system and has long common property lines that run north and south or east and west along half-section or quarter-section lines. These common property lines make corridors of opportunity for transmission line routes. Two such corridors were identified in this study area. One such corridor runs almost directly south from Five Points Substation. The other corridor is approximately 1 mile to the west of the first and generally runs southward parallel to the first, mostly along a section line (see Figure 2).

The two route alternatives are very similar in most engineering and environmental respects. Each would require the same type of structures, the same number of major angles, and a similar number of minor angles. Each would require approximately the same number of stream and road crossings, railroad crossings, pipeline crossings, and non-TVA transmission line crossings. Each would involve some special attention to wetlands on the route. The single wetland crossing for each route would be short enough to be spanned without placing any structures in the wetlands. The west route is 6.4 miles long, while the east route is 5.6 miles. However, the east route would involve rebuilding 0.6 mile more of the existing transmission line.

The major differences in the route alternatives involve their respective effects on property. The west route would require easements from 42 property parcels, while the east route would require easements on 36 parcels. The west route would require 77.6 acres of easement; the east route would require 68.4 acres. Most of the properties on both routes are large parcels, and potential uses on these tracts would be diminished only slightly by the transmission line easement. The west route would have only four properties that are less than 5 acres in size, while the east route has only two. Along the west route, 11 homes are located within 300 feet of the transmission line. Five homes are located within 300 feet of the east route. One of these is an unoccupied structure on Dennis Road that would be taken by the easement.

A major difference in the two routes is in the amount of property severance involved. Both routes were located along the back edges of property parcels as much as is practical. Approximately 14,010 feet of the west route would "sever" parcels (i.e., cross through parcels away from the edges). Much of this would cross uplands in timber production. Approximately 6,100 total feet of the east route would sever parcels, and much of this length lies in open pasturelands near U.S. Highway (US) 80.

2.5. Identification of the Preferred Route Segment

As discussed in Section 1.5, TVA invited public and property owner comments on identified transmission line route options. The route options were modified slightly based on input received both in the open house on December 2, 2004, and during the comment period that ended January 3, 2005.

Based on the differences described above, particularly those related to land use effects, and the comments from affected landowners, the east route was the preferred route.

2.6. Comparison of Alternatives

Under the No Action Alternative, a new 6-mile-long 161-kV transmission line would not be constructed, and 11.5 miles of existing transmission line would not be rebuilt. Thus, there would be essentially no change from the current condition. Therefore, adoption of the No Action Alternative is not expected to cause any additional environmental effects.

Adoption of the Alternative B would involve the construction of approximately 6 miles of 161-kV transmission line on new right-of-way and the rebuilding of approximately 11.5 miles of transmission line on existing right-of-way. Because clearing of the new right-of-way would be required on the 6-mile-long segment, there would be some construction-related environmental effects. However, appropriate precautions would be used during construction to reduce potential effects. Operational effects of the proposed action are expected to be minor and insignificant. Overall, potential direct, indirect, and cumulative effects from implementation of the Action Alternative are expected to be minor and insignificant.

2.7. The Preferred Alternative

TVA's preferred alternative is Alternative B, i.e., to build approximately 6 miles of new 161-kV transmission line and rebuild 11.5 miles of transmission line from the Five Points Substation to the Homewood Substation.

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CHAPTER 3

3. AFFECTED ENVIRONMENT

The present condition of various environmental resources is described in this chapter. Brief descriptions of those resources that could be affected by the proposed action are provided in the sections below.

3.1. Terrestrial Biology

The description of potentially affected terrestrial biological resources is divided into two major sections--plant life and animal life. These sections also contain listings of threatened and endangered species found within the project area.

3.1.1. Plant Life

3.1.1.1.Common Plants

The project area lies within the East Gulf Coastal Plain Section of the Coastal Plain Physiographic Province (Fenneman, 1938). This area of central Mississippi is characterized by fairly uniform topography, with elevations ranging from 400 to 500 feet above sea level. The project area is in the Gulf Slope Section of the North Central Plateau Region (Braun, 1950). Native forests of this region are characterized by mixtures of pines, oaks, and hickories. Although the historic forests were probably dominated by hardwoods, second-growth stands in this region are frequently dominated by loblolly pine.

Plant communities within the right-of-way and immediately adjacent to the right-of-way can be grouped into eight broad categories: (1) early successional habitats (managed pastures, old fields, and rights-of-way), (2) pine forests, (3) streams and associated wetland, (4) mesic hardwood forests, (5) bottomland hardwood forests, (6) lawn, (7) Jackson Prairie, and (8) cultivated row crops (primarily corn). A detailed list of common and representative plant species observed in the project area, along with a notation of the plant community(s) in which each species was most frequently observed, is provided as Appendix E.

Early successional habitats cover about 85 percent of the power line route. This community is dominated by grasses. Managed pastures and managed rights-of-way are prevalent, but old-field habitats are also present.

Managed pastures in the project area are dominated by tall fescue and Bermuda grass. Additional grass species present include annual rye grass, bahia grass, field paspalum, Johnson grass, southern carpet grass, and vasey grass. Other plant species within this vegetation type include Brazilian vervain, Canada horseweed, Carolina nightshade, cespitose smartweed, dotted smartweed, field garlic, hairy buttercup, small dog fennel, thoroughwort, spiny amaranth, Virginia buttonweed, and woolly croton.

Existing rights-of-way comprises a large portion of the project area. Sapling species in these areas are similar to those found in surrounding forests. Common grass species include big bluestem, broom sedge, eastern gama grass, little bluestem, and vasey grass. Other representative species include annual sump weed, black-eyed Susan, bush aster, Canada goldenrod, Chinese bush clover, eastern false willow, hairy elephantfoot, late-

flowering thoroughwort, pepper-vine, serrate-leaf blackberry, southern dewberry, trumpet creeper, and winged sumac.

A small portion of the project area was clear-cut less than five years ago, and the present vegetation in these areas is similar to the vegetation in rights-of-way. Areas that were clear-cut 5 to 15 years ago are now covered by young pine or hardwood forest. Tree species in these older clear-cut areas are similar to those in the forest communities discussed below.

Pine forests occupy about 6.5 percent of the proposed transmission line route. Most of these forests are pine plantations. However, some areas are natural stands. Hardwood and herbaceous species in pine forests in the project area are similar to those found in mesic and bottomland hardwood forest communities. These include American beautyberry, American beech, American elm, black gum, box elder, bracken fern, Cherokee sedge, cherrybark oak, Chinese privet, common greenbriar, cross vine, deciduous holly, Elliott blueberry, giant cane, green ash, Indian seaoats, Japanese honeysuckle, muscadine grape, pecan, pepper-vine, poison ivy, post oak, red maple, redvine, saw greenbriar, slender spike grass, southern shagbark hickory, sparkleberry, sugarberry, sweet gum, sweet pignut hickory, trumpet creeper, tulip tree, variable witch grass, Virginia creeper, Virginia dayflower, yellow jessamine, water oak, white grass, white oak, willow oak, and winged elm.

Streams and associated wetlands make up about 4.5 percent of the proposed right-of-way. Plant species typical of these areas include American potato-bean, black willow, blunt spike-rush, broom panic grass, cinnamon fern, climbing hempweed, common boneset, common buttonbush, dwarf palmetto, egg-leaf Indian-plantain, false indigo-bush, floating seed box, giant cane, marsh pepper smartweed, rice cutgrass, royal fern, sensitive fern, shallow sedge, small-spike false-nettle, soft rush, spotted water-hemlock, subarctic lady fern, sugar cane plume grass, sweet bay magnolia, and woolgrass.

Mesic hardwood forests occur on slopes and hilltops throughout the project area and account for about 1.5 percent of the vegetative cover along the proposed route. American beech, eastern red cedar, loblolly pine, post oak, tulip tree, white oak, and winged elm are the most common canopy species in this community. Characteristic understory trees and shrubs include American beautyberry, Chinese privet, eastern redbud, flowering dogwood, sparkleberry, and white fringe tree. Common understory vines include common greenbriar, Japanese honeysuckle, saw greenbriar, Virginia creeper, and yellow jessamine. Herbaceous vegetation is limited in this community, but includes bracken fern, Cherokee sedge, slender spike grass, variable witch grass, Virginia wild rye, and woodland sedge. This cover type occupies about 1.5 percent of the project area.

Bottomland hardwood forests in the project area are typically limited to narrow strips along streams and occupy about 1 percent of the transmission line route. Common forest canopy species typical of this community include American elm, black gum, box elder, cherrybark oak, eastern cottonwood, green ash, overcup oak, pecan, red maple, southern shagbark hickory, sugarberry, swamp chestnut oak, sweet gum, sweet pignut hickory, water oak, and willow oak. Characteristic understory trees and shrubs include American holly, American hornbeam, Chinese privet, deciduous holly, Elliott blueberry, giant cane, rough-leaf dogwood, and southern bayberry. Common understory vines include common greenbriar, cross vine, muscadine grape, peppervine, poison ivy, red vine, and trumpet creeper.

Herbaceous vegetation is limited, but includes Indian sea oats, Nepalese brown-top, partridge berry, Virginia dayflower, and white grass.

Lawns occupy less than 1 percent of the line route. Common turf grass species include Bahia grass, Bermuda grass, centipede grass, and southern carpetgrass. Typical weed species include Carolina bristly-mallow, Carolina pony-foot, juniper-leaf, purple cudweed, smooth crabgrass, southern crabgrass, white clover, and yellow wood sorrel.

The Jackson Prairie occupies less than 1 percent of the power line right-of-way. These areas occur on shallow soils on hilltops. Eastern red cedar, Osage orange, chinkapin oak and Durand's white oak are common saplings in these areas. Common woody vines and shrubs include Alabama supple-jack, Chickasaw plum, coralberry, rusty blackhaw, and yellow-puff. Herbaceous plants include black-eyed Susan, gray head coneflower, prairie bundle-flower, little bluestem, purple prairie-clover, and racemed milkwort. These species are typical for this community. The Jackson Prairie has a state rank of S1, which indicates that this ecological community occurs in five or fewer locations in Mississippi. The Jackson Prairie has potentially suitable habitat for the rare plant, Great Plains ladies'-tresses (see Section 3.1.1.3).

Row crops (primarily corn) are planted in a very small area along the existing right-of-way. These crops appear to have been planted to attract deer for hunting purposes.

3.1.1.2. Invasive Terrestrial Plants

Two plant species listed by Mississippi as "noxious weeds" were encountered within the project area. These are Chinese tallow tree and cogon grass. Cogon grass is also on the Federal Noxious Weeds List.

Five populations of Chinese tallow tree were found on the proposed project route. Thirty-seven trees were found on the proposed new power line route at three locations, and an additional 18 trees were found on the existing right-of-way at two locations.

One population of cogon grass was found on the existing power line route. This population extends into the surrounding pine plantation.

Other invasive exotic plant species encountered along the proposed route include Johnson grass, chinaberry tree, Chinese privet, Chinese bush clover, and Japanese honeysuckle. These species have the potential to affect native plant communities adversely because of their ability to spread rapidly and displace native vegetation.

3.1.1.3. Threatened and Endangered Plants

A review of the Mississippi Natural Heritage Program database indicated that there are 15 state-listed plant species known from Scott County, Mississippi. These species are listed in Table 1. No plant species listed as threatened or endangered at the federal level are known to occur in the area.

Plant species considered as rare in the state of Mississippi are not assigned an official state status, such as 'endangered' or 'threatened.' Instead, the Mississippi Natural Heritage Program uses the heritage ranking system developed by The Nature Conservancy to indicate the relative rarity of state-listed species. Two of the plant species listed in Table 1 are considered to be "critically imperiled" in Mississippi (i.e., state rank of S1).

Table 1. Rare Plant Species Reported from Scott County, Mississippi

Common Name	Scientific Name	State Rank[1]
Appendaged lobelia	*Lobelia appendiculata*	S2S3
Ashe hawthorn	*Crataegus ashei*	S1
Blackfoot quillwort	*Isoetes melanopoda*	S1
Crested fringed orchid	*Platanthera cristata*	S3
Delta post oak	*Quercus mississippiensis*	S3
Eastern purple coneflower	*Echinacea purpurea*	S3S4
Great Plains ladies'-tresses	*Spiranthes magnicamporum*	S2S3
Lesser ladies'-tresses	*Spiranthes ovalis*	S2S3
Mead's sedge	*Carex meadii*	S4S5
Oglethorpe oak	*Quercus oglethorpensis*	S2[2]
Prairie milkweed	*Asclepias hirtella*	S2
Purple fringeless orchid	*Platanthera peramoena*	S2S3
Rough rattlesnake-root	*Prenanthes aspera*	S2
Three-flowered hawthorn	*Crataegus triflora*	S1S2
Virginia pine	*Pinus virginiana*	S2

[1] S1 – Critically imperiled in Mississippi with 5 or fewer occurrences
S2 – Imperiled with 6 to 20 occurrences
S3 – Rare or uncommon with 21 to 100 occurrences
S4 – Widespread, abundant, and apparently secure with more than 101 occurrences
S5 – Demonstrably widespread, abundant, and secure
[2] Status under review

Field surveys for rare plant species were conducted throughout the proposed project right-of-way during June 2005. One rare plant community, the Jackson Prairie, was encountered along the proposed project route. Two state listed plant species not previously reported from Scott County were found along the existing right-of-way. These were the Carolina anglepod (*Matelea carolinensis*) and climbing milkweed (*Matelea obliqua*). A population of eastern purple coneflower and two small areas of suitable habitat for Great Plains ladies'-tresses were also identified.

A total of 13 Carolina anglepod, 5 climbing milkweed, and 8 eastern purple coneflower plants were identified at five locations. One Carolina anglepod plant was found at each of two locations, and 11 Carolina anglepod plants plus 8 eastern purple coneflower plants were found on the banks of a small creek. Two and three climbing milkweed plants were found at each of the two remaining locations. Two small areas of suitable habitat for Great Plains ladies'-tresses were identified in the Jackson Prairie communities.

Ashe hawthorn is typically found on dry limestone outcroppings and soil overlying limestone in natural hardwood forests. Areas adjacent to the existing power line route in the Jackson Prairie were the most likely locations for the Ashe hawthorn, but the plant was not found in the project area.

No federally listed or state-listed plant species were observed within the area that would be cleared for new transmission line right-of-way.

3.1.2. Animal Life

3.1.2.1. Common Terrestrial Animals

Approximately 52 percent of the 11.5-mile upgrade section and 55 percent of the approximately 6-mile proposed new section of right-of-way is surrounded by southern mixed forests. Approximately half of this forested habitat is in a post-timbering, mid-successional stage with a dense understory, and a poorly developed canopy. In addition, the forested habitat occurs within a matrix of agricultural, urban/residential development, pine woodlands, and old field/early successional habitats. See Section 3.1.1 (Plant Life) for percent coverage of plant communities within the transmission line corridor.

A diverse bird community exists in the project area due to the variety of habitat types along the right-of-way. Because of habitat fragmentation and habitat edges along the proposed project centerline, the most abundant bird species were those tolerant of such disturbance. Twenty-nine species of birds were observed along the right-of-way, including wild turkey, yellow-billed cuckoo, blue jay, Carolina wren, Carolina chickadee, yellow-breasted chat, indigo bunting, northern cardinal, and brown-headed cowbird. Wood thrush and pileated woodpecker, which typically occur in forest interiors, were also observed. Mammals observed or typical of the area include coyote, raccoon, white-tailed deer, opossum, and armadillo. Common reptiles and amphibians found in this habitat include three-toed box turtles, indigo snakes, pine snakes, milk snakes, and gray tree frogs.

Older growth loblolly and shortleaf pine forests occur between structures 90 and 100 and within the Bienville National Forest. These forests provide habitat for many of the species mentioned above and for the red-cockaded woodpecker, brown-headed nuthatch, Bachman's sparrow, and other bird species.

Ponds and wetlands in the project area provide habitat for bullfrog, eastern narrow-mouthed toad, green frog, southern cricket frog, and western cottonmouth. Streams and springs may also provide habitat for amphibians such as marbled, red, and southern two-lined salamanders.

3.1.2.2. Threatened and Endangered Terrestrial Animals

Field investigations in 2005 did not reveal the presence of any endangered, threatened, or special status animal species in the project area. However, review of the TVA Natural Heritage databases indicated that three animal species with federal or state status are reported from Newton, Scott, and Smith Counties, Mississippi (see Table 2). Nine additional species known to occur in these counties are considered "uncommon" by the Mississippi Natural Heritage Program, but they do not have official state status.

Flatwoods salamanders occur in seasonally wet pine flatwoods and pine savannas and breed in ephemeral habitats including roadside ditches, ponds, and swamps (Petranka, 1998). One record is known for this species in the project area. The location of this record is outside of the known range of this species.

Four-toed salamanders inhabit forests surrounding swamps, bogs, marshes, vernal ponds, and other fish-free habitats that serve as breeding sites (Petranka, 1998). One population is known from the general project area. No habitat for this species exists along the proposed transmission line route.

Table 2. Listed Terrestrial Animal Species Reported from Newton, Scott, and Smith Counties, Mississippi

Common Name	Scientific Name	Federal Status	State Status[1]
Flatwoods salamander	*Ambystoma cingulatum*	-	No status[2]
Four-toed salamander	*Hemidactylium scutatum*	-	No status
Red salamander	*Pseudotriton ruber*	-	No status
Alligator	*Alligator mississippiensis*	-	No status
Scarlet snake	*Cemophora coccinea*	-	No status
Coal skink	*Eumeces anthracinus*	-	No status
Ringed map turtle	*Graptemys oculifera*	Threatened	Endangered
Alligator snapping turtle	*Macrochelys temminckii*	-	No status
Queen snake	*Regina septemvittata*	-	No status
Red-cockaded woodpecker	*Picoides borealis*	Endangered	Endangered
Louisiana black bear	*Ursus americanus luteolus*	Threatened	Endangered
Southeastern shrew	*Sorex longirostris*	-	No status

[1]State status is according to the Mississippi Department of Wildlife, Fisheries, and Parks (2004)
[2]No legal status, but tracked by Mississippi Natural Heritage Program

Red salamanders are typically found near small headwater streams, seepages, and spring-fed bogs (Petranka, 1998). Habitat exists for this species in the project area.

Alligators live primarily in freshwater swamps, marshes, but also occur in rivers, lakes, and small bodies of water. The project area is considered outside of the main range of this species. No habitat for this species exists along the proposed transmission line route.

Scarlet snakes are most often found in pine, hardwood, or mixed oak-pine woodlands with an understory of wiregrass (Ernst and Ernst, 2003). Habitat does exist for this species in the project area.

Coal skinks typically inhabit moist, wooded hillsides near springs and rocky bluffs (Conant and Collins, 1998). Habitat for this species is rare within the project area.

Ringed map turtles prefer wide rivers with strong currents, adjacent white sand beaches, and an abundance of basking sites in the form of brush, logs, and debris (Ernst, Lovich, and Barbour, 1994). No habitat for this species exists along the proposed transmission line route.

Alligator snapping turtles are typically found in deep water of large rivers and their major tributaries, but they also can be found in lakes, ponds, and swamps (Ibid). No habitat for this species exists along the proposed transmission line route.

Queen snakes occur in clean, unpolluted brooks, streams, rivers, or marshes in open areas or woodlands where crayfish are present (Ernst and Ernst, 2003). Habitat for this species exists within the project area.

Red-cockaded woodpeckers inhabit old-growth pine forests with an open understory. Most of the pine woodlands in the project area do not fit the criteria for suitable red-cockaded woodpecker habitat. There are historical accounts of a recorded colony located

approximately 350 feet from the proposed transmission line route. However, field investigations in 2005 did not locate an active colony in this location.

Louisiana black bears frequent extensive deciduous forests, especially in areas with forest openings. Habitat for the black bear exists in the project area, but it is of low quality due to fragmentation. Because they range over long distances, Louisiana black bears may possibly move through the area on occasion.

Southeastern shrews are found in a variety of habitats. They prefer moist situations in woods or fields (Linzey, 1998) including disturbed habitat such as abandoned fields with dense ground cover of honeysuckle, grasses, sedges, and herbs (Linzey and Brecht, 2002). This species likely occurs in the project area.

3.2. Aquatic Biology

3.2.1. Common Aquatic Life

The proposed project route extends across portions of three watersheds, including Tuscolameta Creek and its associated canals in the Pearl River Basin, and the Leaf River and West Tallahala Creek in the Pascagoula River Basin. The Leaf River and West Tallahala Creek watersheds are located partially in the Bienville National Forest. Most streams in the project area are slow flowing and meandering.

There are no recent data available for aquatic communities in the project area. Fisheries data are listed in Table 3. The most recent collection was made in 1975. Although these data are indicative of what has been found historically in this section of the Leaf River and do not necessarily indicate the current species composition, the aquatic community composition in the project area is likely similar to that found in historical collections in surrounding areas.

Field surveys in June 2005 documented a total of 33 watercourses within the project area and along the associated access roads. Thirteen of these watercourses were perennial, 10 were intermittent, 8 were wet-weather conveyances, and two were ponds. Key features of each watercourse are summarized in Table 4.

A field survey of the existing right-of-way between Lake and Homewood revealed that maintenance practices used by CEPA and SMEPA did not conform to TVA's right-of-way management strategy (Muncy, 1999). SMZs were nonexistent. No woody vegetation was present along any of the stream banks that crossed the right-of-way, and the banks of several large perennial streams had been bulldozed into the stream channel to make fords, presumably for heavy mowing equipment. Heavy layers of silt were present in many of the stream channels within and downstream of the right-of-way, and filamentous algae were prevalent.

Siltation can have detrimental effects on aquatic animals adapted to riverine environments. Riverine mussel species are best suited to live in clean sand and gravel substrates. Fine sediment tends to clog mussel gills and suffocate the animals (Parmalee and Bogan, 1998). Turbidity caused by suspended sediment can also negatively impact spawning success and the ability of many fish species to feed (Sutherland et al., 2002).

Table 3. Fish Species in Historical Collections From the Leaf River System in Scott County, Mississippi

Common Name	Scientific Name	Collection Locale	Collection Date
Redfin pickerel	*Esox americanus*	Hole in river bed at its source in Scott County	09/05/1947
Clear chub	*Notropis winchelli*	at State Route 501	03/26/1974
Tadpole madtom	*Noturus gyrinus*	at State Route 501	03/26/1974
Cherryfin shiner	*Lythrurus roseipinnis*	at State Route 501	03/26/1974
Blackspotted topminnow	*Fundulus olivaceus*	at State Route 501	03/26/1974
Weed shiner	*Notropis texanus*	at State Route 501	03/26/1974
Longear sunfish	*Lepomis megalotis*	at State Route 501	03/26/1974
Blacktail shiner	*Cyprinella venusta*	at State Route 501	03/26/1974
Speckled madtom	*Noturus leptacanthus*	at State Route 501	03/26/1974
Redfin pickerel	*Esox americanus*	estimated: crossing between Norris and Otho	09/05/1947
Largemouth bass	*Micropterus salmoides*	estimated: crossing between Norris and Otho	09/05/1947
Warmouth	*Lepomis gulosus*	estimated: crossing between Norris and Otho	09/05/1947
Redspotted sunfish	*Lepomis miniatus*	estimated: crossing between Norris and Otho	09/05/1947
Pirate perch	*Aphredoderus sayanus*	estimated: crossing between Norris and Otho	09/05/1947
Cherryfin shiner	*Lythrurus roseipinnis*	estimated: crossing between Norris and Otho	09/05/1947
Warmouth	*Lepomis gulosus*	Bienville National Forest, 1.0 mile from game warden's house	09/14/1975
Black bullhead	*Ameiurus melas*	Bienville National Forest, 1.0 mile from game warden's house	09/14/1975
Pugnose minnow	*Opsopoeodus emiliae*	None given	09/05/1947

Source: Todd Slack, nongame research biologist and curator of fishes, Mississippi Museum of Natural Science, personal communication of database search results on September 27, 2005.

The lack of riparian buffer zones is likely the reason for the excessive growth of algae in the streams crossing the right-of-way. A combination of the lack of shade and lack of a buffer against agricultural runoff may have led to this increase in algae productivity. An overabundance of algae in a stream can lead to increased biological oxygen demand (BOD). This is a problem in many streams of the eastern United States, particularly those that originate in swampy lowland areas such as streams in the Bienville National Forest (Mallin et al., 2004). Increased BOD lowers the amount of dissolved oxygen in a stream, which, if unchecked, could suffocate aquatic animal life.

Table 4. Key Features of Watercourse Crossings in the Proposed Five Points-Homewood Transmission Line Right-of-Way and Along Associated Access Roads

Stream Label[1]	Route Location	Station Number (Estimated)	Stream Type[2]	Streamside Management Zone Classification	Latitude[3]	Longitude[3]	Description
ASB1	New	26+00	WWC	Best management practices (BMPs)	32.38636	89.34988	Grassy conveyance; cattle cross regularly
ASB2	New	35+00	WWC	BMPs	32.38375	89.34980	Slight channel formation (2 feet wide; 1 foot deep); landowner has pushed small cut trees into channel
ASB3	New	38+40.21	INT	A (50 feet)	32.38293	89.34982	Channel (3 feet wide; 2 feet deep); mud substrate; 2 streams join at flag ASB3-2 at midpoint of right-of-way
ASB4	New	50+00	INT	A (50 feet)	32.38024	89.34950	Channel (3 feet wide; 10 feet deep); mud and sand substrate; meanders across and along right-of-way; Flags ASB4-1, ASB4-2, and ASB4-3 are not in right-of-way, but SMZ will extend into right-of-way
ASB4-7	New	51+00	INT	A (50 feet)	32.37953	89.34998	Second coordinate for flagging on ASB4; ASB4-7 is part of ASB4
BSBA1	New	104+00	INT	A (50 feet)	32.36374	89.34900	
BSBA2	New	140+00	PER	A (50 feet)	32.35535	89.34646	
BSBA3	Access Road	248+00	PER	A (50 feet)	32.32565	89.34265	Crosses access road that parallels Interstate-20
BSBA4	New	246+00	PER	A (50 feet)	32.32623	89.34223	Channel (4 feet wide; 1 foot deep); in woods between field and pine plantation adjacent to Interstate-20
ASB1	Rebuild	Unknown	WWC	BMPs	Unknown	Unknown	Between Structures 104 and 105; tractor tracks are holding water
ASBA1	Rebuild	Unknown	WWC	BMPs	Unknown	Unknown	Between Structures 90 and 91
ASBA2	Rebuild	Unknown	INT	A (50 feet)	32.13044	89.37937	Already culverted through right-of-way; stream has been dozed in on downstream side of right-of-way; between Structures 90 and 91
ASBA3	Rebuild	Unknown	PER	A (50 feet)	32.30751	89.36575	Channel (3 feet wide; 3 feet deep); American bullfrog breeding site; between Structures 93 and 94

Stream Label[1]	Route Location	Station Number (Estimated)	Stream Type[2]	Streamside Management Zone Classification	Latitude[3]	Longitude[3]	Description
ASBA4	Rebuild	Unknown	INT	A (50 feet)	32.31143	89.35811	Stream is dozed in at midline of right-of-way; between Structures 100 and 101
ASBA5	Rebuild	Unknown	Pond	BMPs	32.30049	89.37939	
ASBA6	Rebuild	Unknown	WWC	BMPs	32.29935	89.38190	Small depression with water; already culverted
ASBA7	Rebuild	Unknown	PER	A (50 feet)	32.29549	89.38943	Culverted with riprap in right-of-way
ASBA8	Rebuild	Unknown	WWC	BMPs	32.29411	89.39272	Culverted in right-of-way; between Structures 79 and 80
ASBA9	Rebuild	Unknown	Pond	BMPs	32.29311	89.39569	
No Label	Rebuild	Unknown	INT	A (50 feet)	Unknown	Unknown	Unnamed tributary to the Leaf River; was not flagged; large stream between ASBA9 and ASBA11
ASBA11	Rebuild	Unknown	PER	A (50 feet)	32.28357	89.41689	Leaf River
ASB2	Rebuild	Unknown	INT	A (50 feet)	32.27795	89.42976	West of State Route 501 at base of Structure 57; channel (15 feet wide; 6 feet deep)
ASB3	Rebuild	Unknown	INT	A (50 feet)	32.26897	89.45030	Between Structures 44 and 45; channel (2 feet wide; 1 foot deep); tractor has mown across the stream repeatedly
ASB4	Rebuild	Unknown	PER	A (50 feet)	32.26418	89.46146	Deeply incised channel (3 feet wide; 3 feet deep); tractor has mown through stream; five species of ferns growing around stream; runs through wetland
ASB5	Rebuild	Unknown	PER	A (50 feet)	32.26406	89.46184	Forms northeast border of wetland (WJB 02); channel (3 feet wide; 2 feet deep)
ASBA10	Rebuild	Unknown	INT	A (50 feet)	32.28097	89.42264	Culverted in right-of-way; water ponded upstream of culvert; Wetland WBY01 downstream of culvert in right-of-way
ASBA12	Rebuild	Unknown	WWC	BMPs	32.27834	89.42845	
ASBA13	Rebuild	Unknown	WWC	BMPs	32.25986	89.47228	Culvert under access road
ASBA14	Rebuild	Unknown	PER	A (50 feet)	32.25805	89.47635	Straight channel deeply incised
ASBA15	Rebuild	Unknown	PER	A (50 feet)	32.25547	89.48176	Wide channel with a bend; banks dozed in for a ford at south edge of right-of-way
ASBA16	Rebuild	Unknown	PER	A (50 feet)	32.25420	89.48433	River cane on east bank; stream dozed in for a ford on south side of right-of-way
ASBA17	Rebuild	Unknown	PER	A (50 feet)	32.25109	89.49113	

Stream Label[1]	Route Location	Station Number (Estimated)	Stream Type[2]	Streamside Management Zone Classification	Latitude[3]	Longitude[3]	Description
ASB6	Rebuild	Unknown	PER	A (50 feet)	32.24534	89.50623	Southwest of Structure 10; deeply incised and eroding; channel (3 feet wide; 3.5 feet deep)

[1]Stream labels are arranged in the order streams were encountered starting at the Five Points Substation working toward the Homewood Substation
[2]Stream Type Codes: INT = Intermittent; PER = Permanent; WWC = Wet-Weather Conveyance
[3]Global Positioning System coordinates given in World Geodetic System of 1984 (WGS 84) datum

3.2.2. Threatened and Endangered Aquatic Species

Review of the TVA Natural Heritage database indicated that six state-listed aquatic animal species are known to occur in the Pearl River and Leaf River drainages within 10 miles of the proposed project. No federally listed as threatened or endangered species are known to occur in these drainages. These species are listed in Table 5.

Table 5. Sensitive Aquatic Animal Species Known to Occur Within 10 Miles of the Proposed Five-Points Homewood Project

Common Name	Scientific Name	State Status[1]
Alabama shad	*Alosa alabamae*	No status[2]
Jackson Prairie crayfish	*Procambarus barbiger*	No status
Delicate spike	*Elliptio arctata*	Endangered
Spike	*Elliptio dilatata*	Endangered
Alabama hickorynut	*Obovaria unicolor*	No status
Mississippi pigtoe	*Pleurobema beadleianum*	No status

[1]State status is according to the Mississippi Department of Wildlife, Fisheries, and Parks (2004)
[2]No legal status, but tracked by Mississippi Natural Heritage Program

The Alabama shad, a saltwater species, is reported to make spawning runs into several tributaries of the Gulf of Mexico, including the Lake Pontchartrain, Pascagoula River, Tombigbee, and Pearl River drainages. The Alabama shad makes spawning runs from February to April in swift water over sand and gravel substrate (Ross et al., 2001).

The Jackson Prairie crayfish is known to occur only in Jasper, Newton, Rankin, and Scott Counties in Mississippi. It constructs burrows in well-drained prairie soils away from running water (NatureServe, 2005). The Jackson Prairie crayfish is intolerant of soil disturbances and agricultural practices and, consequently, populations have been steadily declining (T. Mann, Mississippi Natural Heritage Program, personal communication, August 3, 2005). This species may also be susceptible to toxic effects of broadcast herbicides.

The delicate spike is listed as endangered in the state of Mississippi. This mussel is known to occur in the Coosa, Escambia, Apalachicola, and Pearl River systems. It is commonly found in substrates of coarse sand and gravel associated with strong current and large cobble (Parmalee and Bogan, 1998).

The spike mussel is listed as endangered in the state of Mississippi. This species is known to occur throughout the entire Mississippi River drainage. It is considered stable throughout most of its range but is locally rare in Mississippi (NatureServe, 2005). The spike is found in both deep and shallow water habitats, but is most frequently associated with moderate to strong current and firm substrates composed of coarse sand and gravel (Parmalee and Bogan, 1998).

The Alabama hickorynut, a mussel, has been extirpated from large portions of its historic range and is currently found only in large streams of the Western Mobile Basin. It is most often found in sand and gravel substrates in moderately flowing water (NatureServe, 2005).

Within the region, the Mississippi pigtoe mussel is known to occur in the Leaf, Pearl, Black River drainages. Little is known of its habitat preferences. However, a similar species, the Alabama clubshell (*Pleurobema troschellianum*), is most often found in small to medium-sized rivers with moderate current and sand and gravel substrates (Parmalee and Bogan, 1998).

3.3. Surface Water

Precipitation in the project area averages about 56 inches per year. The wettest month is March at 6.1 inches of precipitation, and the driest month is September with 3.3 inches. The average annual air temperature is 63 degrees Fahrenheit (^{o}F). Temperature ranges from a monthly average of 43^{o}F in January to 81^{o}F in July. Stream flow varies with rainfall and averages about 20 inches of runoff per year. The average annual flow of the Pearl River at Carthage, Mississippi, is 1,982 cubic feet per second (cfs) or 1.47 cfs per square mile.

The project area drains to tributaries of the Pearl River and the Pascagoula River. In the Pearl River Basin, surface water in the project area drains to Warrior Creek/Canal (and its tributary, Wolf Branch) of Tuscolameta Creek (Little Canal). In the Pascagoula River Basin, the surface water drains to the Leaf River and its tributaries: West Tallahala Creek, Oakahay Creek, and Tallabogue Creek (and its tributary, Mill Branch).

All of the streams in the project area are classified by the state for fish and wildlife according to the Mississippi Department of Environmental Quality (MDEQ), 2003. Tuscolameta Creek (from near Walnut Grove to the Pearl River) is on the state 303 (d) list due to impaired aquatic life support from biological impairment (Ibid, 2004). The Leaf River (from near Lorena to the confluence with Tishkill Creek and from the confluence with West Tallahala Creek to the confluence with Keys Mill Creek) is listed due to impaired aquatic life support from biological impairment. The Oakahay Creek (from the headwaters to the confluence with Clear Creek) is impaired for aquatic life support from biological impairment and for secondary contact from pathogens. West Tallahala Creek (from the headwaters to the confluence with the Leaf River) is impaired for aquatic life support from biological impairment.

3.4. Wetlands

Due to the relatively low topographic relief and hydrologic characteristics of the streams in this region, wetlands are relatively common. Wetland determinations were performed in the field according to U.S. Army Corps of Engineers (USACE) standards, which require documentation of hydrophytic vegetation, hydric soil, and wetland hydrology (Environmental Laboratory, 1987; Reed, 1997). Broader definitions of wetlands, such as the definition used by the U.S. Fish and Wildlife Service (Cowardin et al., 1979) and TVA internal procedures were also considered in this review. Wetlands were classified according to the Cowardin system (Ibid).

Seven wetlands totaling 5.43 acres were identified along the existing and proposed right-of-way (see Table 6). Five of the wetlands were classified as palustrine emergent wetlands. One wetland was classified as a palustrine scrub-shrub wetland, and one palustrine forested wetland was identified. All of the wetlands meet the USACE parameters for jurisdictional wetlands, which may be regulated under the Clean Water Act. Wetland WJB03 (2.58 acres) and Wetland WJB04 (0.37 acre) are located in the right-of-way corridor for the new transmission line. All the other wetland areas are located along the right-of-way of the existing transmission line.

Table 6. Wetlands Potentially Affected by the Proposed Transmission Line

Wetland Identifier	Estimated Acreage[1]	Type[2]	TVARAM Score	TVARAM Category
WBY01	0.33	Palustrine emergent persistent	14	1
WJB01	0.28	Palustrine emergent persistent	31	1
WJB02	0.6	Palustrine emergent persistent	31.5	1
WBY02	0.4	Palustrine emergent persistent	16	1
WBY03	0.87	Palustrine emergent persistent	19	1
WJB03[3]	2.58	Palustrine scrub-shrub broad-leaved deciduous	31	1
WJB04[3]	0.37	Palustrine forested broad-leaved deciduous	2	1
Total	**5.43 acres**			

[1] Estimated acreage represents only the wetland acreage within the proposed right-of-way; each of these wetlands extends beyond the proposed right-of-way boundaries
[2] Wetland type is according to Cowardin et al. (1979)
[3] Wetland is located within the right-of-way of the proposed transmission line

TVA has developed a version of the Ohio Rapid Assessment Method (Mack, 2001) that is specific to the TVA region. This method, called TVARAM, can be used to assess wetland condition and to identify wetlands with special ecological significance. Use of the TVARAM can also aid in guiding wetland mitigation decisions consistent with TVA's independent responsibilities under the National Environmental Policy Act (NEPA) and the Wetlands EO (11990). All of the wetlands identified in the proposed right-of-way were evaluated with the TVARAM, as all would be subject to new disturbance.

The TVARAM was used to distinguish the following three categories of wetlands:

- Category 1 wetlands are described as "limited quality waters." They represent resources that have been degraded, have limited potential for restoration, or are of such low functionality that lower standards for avoidance, minimization, and mitigation can be applied.
- Category 2 includes wetlands of moderate quality and wetlands that are degraded but could be restored. Avoidance and minimization are the first lines of mitigation.
- Category 3 generally includes wetlands of very high quality and wetlands that are of regional or statewide concern, such as wetlands that provide habitat for threatened or endangered species. All practicable attempts are made to avoid any disturbance of Category 3 wetlands and their buffer zones.

3.5. Groundwater

The project area is underlain by the Mississippi embayment aquifer system and is part of the Coastal Plain Physiographic Province. Geologic units of the aquifer system range from Late Cretaceous to Middle Eocene in age. The Mississippi embayment aquifer system is divided into nine hydrogeologic units consisting of six regional aquifers and three regional confining units. (A confining unit is an underground layer that blocks the movement of groundwater.) Large, thick clay and shale confining units separate some parts of the aquifer system into distinct, regional aquifers that are largely homogeneous sand. Gravity is the principal driving force for groundwater movement within the Mississippi embayment aquifer system (Renken, 1998).

Three of the nine hydrogeologic units that make up the Mississippi embayment aquifer system are exposed at the surface within the project area. These are the upper Claiborne and the middle Claiborne, which are separated by a confining unit. The upper Claiborne contains the Cockfield Formation, which consists of thick beds of fine- to medium-grained sand, clay, and some thin beds of lignite. Underlying the upper Claiborne is a confining unit known as the Cook Mountain Formation, which consists of clay and shale. The middle Claiborne is made up of the Sparta Sand, which underlies the Cook Mountain Formation (MDEQ, 2004).

Groundwater is abundant throughout Mississippi. In the project area, public and private wells pump water from several aquifers. Deep wells are used to supply public water systems from deeper aquifers, while private wells are usually cased in shallow aquifers. Contamination of groundwater can occur when contaminants such as pesticides and fertilizers from agricultural runoff seep into the aquifer. Most public water sources are protected from contamination due to the depth of the wells, which are naturally protected by overlying clay (confining) layers. Groundwater is the primary source for public water supply for Scott County (USEPA, 2005).

3.6. Visual Quality

Visual resources are based on existing landscape character, distances of available views, sensitivity of viewing points, human perceptions of landscape beauty/sense of place (scenic attractiveness), and the degree of visual unity and wholeness of the natural landscape in the course of human alteration (scenic integrity).

The proposed transmission line route would begin near the small rural residential area known as Five Points. From its beginning at the existing Five Points Substation, the proposed route would extend about 6 miles to the south to a point near an existing distributor substation before assuming a course along existing right-of-way. It would continue approximately 11.5 more miles before terminating near the small community of Homewood, Mississippi. Visual resources along the proposed route were evaluated from Five Points to the terminus near Homewood. Along the route, the scenic attractiveness is common and the scenic integrity is moderate to low.

The proposed transmission line corridor begins at the existing CEPA Five Points Substation, which is located to the east of the rural community of Usrytown. Foreground views (0 to 0.5 mile from the observer) and middleground views (0.5 mile to 4 miles from the observer) are defined by agricultural fields, mature hardwood forests, scattered residences, farm outbuildings, and existing power lines. The topography is gently sloping to

flat in the vicinity, and vegetation ranges from mature hardwood stands to young planted pine plantations. The proposed corridor would leave the existing substation and travel due south, crossing Old US 80 toward the community of Dennis.

As the corridor crosses the roadway, vegetation patterns and topography remain similar to the south. Pastureland, mature forest, and residences lie between Old US 80 to the east and Good Hope Road to the west, where the landscape character is mostly rural and agrarian. The topography varies little within this section as the corridor crosses Wolf Branch and Warrior Creek. Approaching the Dennis Graveyard Road, views become open in the foreground and up to the middleground, as topography vegetation permits. As the corridor crosses the Dennis Graveyard Road, vegetation patterns change from mixed pasture and forest to dense young-growth pine plantations, and views once again become limited to the immediate foreground.

The proposed transmission line corridor would continue south, between Good Hope and Dennis Roads. The route would pass a tributary of the Warrior Creek through dense vegetation as it reaches Dennis Road. Here the topography moderates, and the vegetation patterns change, as views open over the rural roadway and into pastureland beyond into the middleground-viewing distance. Several residences line the roadway of this small rural community, and a large poultry production facility is visible in the foreground near the intersections of Dennis Road and Good Hope Road. The corridor would continue south to southeast, approaching US 80 across flat pasturelands, where mature vegetation is present in few locations along creek banks and at the edges of pastures.

At the US 80 crossing, a thin banding of vegetation partially screens views of the back-lying grazing lands beyond the elevated roadway to the north and south. Through the partial screen, motorists have only brief, intermittent foreground views of the pastoral landscape character through roadside vegetation. Seasonal variations in foliage patterns would allow greater views into the middleground; however, duration of view would remain relatively short. The proposed corridor would continue in this manner, over similar terrain and vegetation patterns. Views here are limited to the foreground-viewing distance as the route crosses a rail line and approaches Old Sawmill Road.

At the Old Sawmill Road crossing, views to the north are generally prohibited due to the dense roadside vegetation and the even topography. Views available to the south are open intermittently through light roadside vegetation into the foreground viewing distance. The landscape character within this section is rural and pastoral, and motorists have confined views along the narrow roadway and limited views of the pastureland to the south. The proposed corridor would follow the edges of the pastureland before entering mature vegetation again. The route then takes a southeasterly course for a short distance prior to entering open areas that provide views into the middleground viewing distance. The proposed corridor would pass within the foreground view of a constructed pond and would cross a small, unnamed stream as it approaches Interstate 20.

As the proposed route crosses Interstate 20, the roadside vegetation becomes denser, and this generally screens views otherwise available to motorists traveling the east/west interstate connecting Jackson and Meridian, Mississippi. Those views along the roadway are generally high in frequency as the traffic volume exceeds 17,000 vehicles per day (Mississippi Department of Transportation, 2005). However, the duration of views available is brief, and the landscape character is typical of an interstate corridor. The proposed transmission line corridor would be very near to the north/south exit for the town of Lake,

Mississippi. The Lake Norris Road, which loosely parallels this short section, offers brief and limited views from the foreground distance to motorists as the proposed route reaches a distributor substation and assumes a course southwest along existing right-of-way. Views available at this point, from near the intersection of Lake Norris Road and Mudline Road are confined to primarily the foreground distance and are predominated by the existing substation and recent timber harvesting operations.

The proposed route occupies existing maintained right-of-way from this point to the terminus near Homewood, Mississippi. As the existing 69-kV transmission line leaves the substation, views are available from Lake Norris Road only briefly, as the roadway continues westward along the gradually steepening topography, and the existing 69-kV line maintains a southwesterly course into the Bienville National Forest. Few homes and primary travelways are located within the national forest, and views are generally limited to existing roadway crossings and at locations where topography and vegetation patterns permit. A number of stream and creek crossings occur within this section of the proposed route, and the vegetation patterns visible are typical to the national forest setting. Changes in topography are pronounced as the flat or gently rolling pasturelands give way to more moderately sloping ranges with high points that are forested and spotted with residences and lowlands, which include winding creeks and agricultural operations.

The primary roadway in this section is the Lake Norris Road, which loosely parallels the existing 69-kV line. However, a number of lesser rural roadways connect locations in the vicinity to the north/south roadways of State Route (SR) 501 and SR 35. The next vantage point to view the proposed transmission line is at the existing roadway crossing along Sherman Hill Road where the existing wooden pole structures and right-of-way cross the lightly traveled roadway. Several residences line the roadway and lie in the foreground and middleground distance. However, local views are largely obscured except for locations along maintained right-of-way where topography sometimes allows views into the middleground.

A similar roadway crossing exists along SR 501 and Norris Homewood Road, where views are limited to the foreground, and mature vegetation lines the existing right-of-way. At the SR 501 crossing, views to the east are of mature hardwood vegetation and the existing 69-kV line that crosses between. To the west at this crossing point, views of agricultural fields are interspersed among borders of mature vegetation. At the Norris Homewood Road crossing, views from the roadway are slightly more expansive to the east over agricultural fields and obscured to the west as the right-of-way enters a densely planted pine plantation.

Continuing west, the proposed route would cross forestland and moderate topography prior to reaching Hopewell Road, which is a paved rural roadway with few residences. One of these is located just to the north of the existing 69-kV route. A thin stand of mature pine trees partially screens views of the transmission line from the residence and views otherwise available to motorists traveling south on Hopewell Road. The views available to the west from this crossing include mature pine and hardwood vegetation on the margins of the existing right-of-way, which gradually rises from the elevation of the roadway and up the gentle slope into the middleground. This topography and vegetation remain typical upland and to the next roadway crossing, which falls upon another section of the Norris Homewood Road. Within this portion of the roadway, traffic is limited, and the roadway changes from a paved two-lane route to a narrower, winding unpaved road. Views to the east are down the gradual slopes and, similarly, those views available to motorists of the existing line as it

continues to the west are slightly upslope and framed with mature vegetation. There are few residences within this section of roadway.

As the route maintains a slightly southwesterly course into similar topography and vegetation, it reaches a small residential area in the vicinity of the Green Grove Church. A number of residences line the Green Grove Road, where the existing 69-kV line crosses the unimproved gravel roadway amid vegetation that varies from mature pines to mature hardwoods to successional vegetation along the roadsides. At this crossing point, the topography moderates to more gentle slopes and small lawns and pastures. This topography and vegetation continue to frame views as the route stretches westward and into the Homewood area and the Old Homewood Road and SR 35 crossings.

Within the vicinity of SR 35, views are confined to the foreground, as vegetation and topography limit the middleground views. The landscape character becomes markedly different on the outskirts of the Homewood community, where the number of residences increases and highway traffic allows an increase in the number of foreground views. The crossing at Old Homewood Road is in the immediate foreground of the SR 35 crossing, and traffic along the north/south roadway may be seen through the existing right-of-way. From the improved two-lane roadway crossing, motorists have views that are limited to the foreground viewing distance, as dense vegetation lines the roadway in the approaches to the maintained right-of-way. Slightly west and up range in topography, the transmission line crosses an unimproved gravel road at Tadlock Road. This infrequently traveled road is flanked by mature vegetation, and expanded views are available only from within the existing right-of-way. Shortly after this road crossing, the existing transmission line bears to the south and approaches the final roadway crossing at Morton Marathon Road prior to entering the existing Homewood Substation. The substation is located immediately adjacent to the improved two-lane roadway and lies opposite the Tadlock Road connection. Several residences line the roadway, and the landscape character may be classified as rural residential with a slightly industrial character in the immediate vicinity of the substation.

3.7. Natural Areas

A review of the TVA Natural Heritage database indicated that the proposed action is located within one managed area (the Bienville National Forest) and is within 3 miles of four additional managed areas or ecologically significant sites. Much of the proposed rebuild section of the existing transmission line falls within the proclamation boundaries of Bienville National Forest. Land within the proclamation boundary is currently in private ownership; however, such land may be acquired at some future time to become part of the national forest. Portions of the existing transmission line (approximately 8,000 feet) cross federally owned land. The Bienville National Forest occupies approximately 178,000 acres in four counties in south central Mississippi. It is managed by the U.S. Forest Service for wildlife, recreation, timber, and various recreational activities.

Two wildlife management areas (WMAs) located within Bienville National Forest are within 3 miles of the proposed action. The Caney Creek WMA and Tallahala WMA, both approximately 28,000 acres, are managed by the Mississippi Department of Wildlife, Fisheries, and Parks for large and small game hunting.

Two ecologically significant sites, Durand Oak Prairie and Pinkston Hill Prairie, are within 3 miles of the proposed action. These sites are significant as habitat for prairie vegetation species within the Jackson Prairie region of Mississippi. Durand Oak Prairie, once privately

owned, has been donated via a conservation easement to The Nature Conservancy. Pinkston Hill Prairie is privately owned.

No Nationwide Rivers Inventory (NRI) stream segments are located within 3 miles of the proposed action.

3.8. Recreation

Recreation in the project area is mostly informal and dispersed. Primary activities include hunting and wildlife observation, and these occur primarily on privately owned land. Portions of the project pass across or near the Bienville National Forest, which is open to the public for hunting, hiking, informal camping, and other forms of recreation. No developed recreational facilities would be affected by the proposal.

3.9. Floodplains

The proposed transmission line right-of-way crosses several floodplain areas. Under EO 11988, an overhead transmission line and related support structures are considered a repetitive action in the 100-year floodplain. The construction of the support structures for the power line are not 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. To minimize adverse impacts on natural and beneficial floodplain values, the right-of-way would be revegetated where natural vegetation is removed and the removal of unique vegetation would be avoided. Best management practices (BMPs) would be used during construction activities.

Some of the construction access roads cross small streams. Any necessary improvements to these roads would be done in such a manner that upstream flood elevations would not be increased. The existing Five Points, Homewood, Sebastopol, and Philadelphia, Mississippi, 161-kV Substations are located outside of the 100-year floodplain.

3.10. Cultural Resources

Central Mississippi has been occupied by humans for over 12,000 years. Prehistoric land use and settlement have varied over time, but short- and long-term habitation sites are located typically on floodplains and alluvial terraces along rivers and tributaries. Specialized campsites tend to be located on older alluvial terraces and in the uplands. The first permanent European-American settlements in the area occurred in the 1830s following the acquisition of the land from the Choctaw and their forced removal. Subsistence and cotton farming typified the agriculture of the region from before the Civil War period to the early 20th century.

Scott County was organized on December 23, 1833. In 1855, the Mississippi-Alabama Railroad selected a route along the south central portion of the county to construct a new rail line. The town of Forest, which was incorporated in 1860, became the trade center of the county upon completion of the railroad. During the Civil War, Hillsboro, the county seat, was burned, and the town of Forest became the county seat (Rowland, 1925).

TVA Cultural Resources staff identified the archaeological Area of Potential Effects (APE) to be the transmission line right-of-way (17 miles long by 100 feet wide). The

architectural/historical APE was identified as the area approximately 0.5 mile along either side of the transmission line corridor over its entire length. A background search was conducted to determine the existence of any previously recorded archaeological sites, surveys, and properties listed or soon to be listed on the National Register of Historic Places (NRHP). No previously recorded sites or NRHP properties were identified within the project area, and no structures had been recorded in the project APE.

An archaeological survey was conducted from June 20-28, 2005, and July 18-22, 2005 (Thomas, 2005). This survey identified no archaeological resources.

CHAPTER 4

4. ENVIRONMENTAL CONSEQUENCES

This chapter is organized in the same order as the previous chapter. Potential environmental effects of adopting the No Action and the Action Alternative are presented in this chapter.

4.1. Terrestrial Biology

4.1.1. No Action Alternative

4.1.1.1. Plants

Under the No Action Alternative, a new right-of-way would not be built. Thus, adoption of the No Action Alternative would not affect terrestrial plants in the project area. For the same reason, adoption of the No Action Alternative would not introduce or spread invasive terrestrial plant species. No project-related impacts to rare plant species would result from adoption of the No Action Alternative.

4.1.1.2. Animals

Likewise, common wildlife would not be impacted under the No Action Alternative. Wildlife species observed in the project area are considered common, both locally and regionally. Therefore, adoption of the No Action Alternative would not result in direct, indirect, or cumulative adverse impacts on wildlife or wildlife habitat.

Adoption of the No Action alternative would not affect threatened or endangered animal species. No threatened or endangered terrestrial animals were encountered during field surveys in 2005, and suitable habitat for the species listed in Table 2 is either not present or of low quality.

4.1.2. Action Alternative

4.1.2.1. Plants

Under the Action Alternative, about 24 acres of forest would be converted to early successional habitat within the new section of right-of-way. The entire 6 miles of new right-of-way would involve about 75 acres. Because forest habitat is plentiful in the region, potential effects to terrestrial plants are expected to be minor and regionally insignificant.

Past land use practices have drastically altered the native vegetation over about 90 percent of the proposed project area. Thus, any additional changes resulting from implementing the proposed project would be minor and insignificant.

Chinese tallow trees, a noxious plant, would be removed as part of the right-of-way clearing operations for the new transmission line. As appropriate and consistent with TVA guidelines (see Appendices A and D), stumps would be chemically treated to prevent resprouting.

Three state-listed plant species were found in the existing right-of-way during field investigations. Carolina anglepod and eastern purple coneflower are considered rare and uncommon in Mississippi, and climbing milkweed is considered imperiled in Mississippi. Because all climbing milkweed plants were located along the extreme south side of the existing power line right-of-way, impacts to plants would be avoided by project activities. The existing right-of-way has two small areas of Jackson Prairie that provide potential habitat for Great Plains ladies'-tresses. These two areas have been marked and would be avoided during construction activities. Thus, potential effects to state-listed plant species would be insignificant.

No federally listed plant species were encountered in the proposed project area. Therefore, no impacts on federally listed plants would occur due to the proposed action.

4.1.2.2. Animals

Under the Action alternative, 6 miles of new right-of-way would be built. An additional 11.5 miles would be rebuilt on existing right-of-way. Wildlife species observed in the project area are considered common, both locally and regionally. Forest fragmentation would be minimal to nonexistent, because the proposed new right-of-way occurs in an already fragmented landscape. Consequently, implementation of the Action Alternative would not result in significant direct, indirect, or cumulative adverse impacts on wildlife or wildlife habitat.

No threatened or endangered terrestrial animals were encountered during field surveys in 2005. Suitable habitat for most species listed in Table 2 does not occur along the proposed transmission line route. Red salamander and queen snakes may occur near streams along the right-of-way. Vegetation along streams within the new right-of-way would be protected with the implementation of BMPs. Thus, potential impacts to these rare species are not anticipated.

Suitable habitat for Louisiana black bears, southeastern shrews, and scarlet snakes exists in the project area. The proposed new right-of-way, however, is located in poor, fragmented habitat for these species. Therefore, construction of the new transmission line segment would not affect these three species.

The two red-cockaded woodpecker nest sites nearest the transmission line corridor do not presently meet the habitat requirements of the woodpecker. Specifically, the pines are not of sufficient size, and the forest understory is too thick. Within the Bienville National Forest, however, a great deal of habitat along the existing right-of-way is used by red-cockaded woodpeckers (U.S. Department of Agriculture, Forest Service, 2004). However, no nesting trees were observed immediately adjacent to the right-of-way within the Bienville National Forest. Because no new right-of-way would be cleared in this section (i.e., no potential nesting trees would be cut), no impacts would occur to red-cockaded woodpeckers. The U.S. Fish and Wildlife Service concurred with this determination (see Appendix F).

4.2. Aquatic Biology

4.2.1. No Action Alternative

Under the No Action Alternative, the proposed action would not be undertaken. Approximately 6 miles of new transmission line construction would not occur. Likewise, TVA would not rebuild the 11.5-mile segment. Thus, there would be no construction-related

impacts to aquatic biology under this alternative. Under the No Action Alternative, SMEPA would continue to perform right-of-way maintenance along the 11.5 miles of existing right-of-way. Water quality degradation from SMEPA right-of-way maintenance along streams (see Section 3.2.1) would likely continue if this alternative were adopted.

4.2.2. Action Alternative

During construction under the Action Alternative, watercourses along the entire right-of-way and along access roads would be protected by the application of Category A (standard) stream protection guidelines, as defined in Muncy (1999). The BMPs and recommended practices specified in the guidelines are intended to minimize soil erosion, subsequent sedimentation of streams, and adverse impacts on the vegetation in riparian buffer areas. In addition, 50-foot-wide SMZs would be established and maintained at the intermittent and perennial stream crossings on the new portion of the line (see Table 4).

Transmission structures are normally located away from surface waters to minimize potential impacts on water quality and aquatic habitat. All construction work, especially near streams, would be conducted consistent with TVA guidelines (see Appendices B and C). BMPs (Muncy, 1999) would also be implemented during transmission line construction to avoid potential effects to water quality and aquatic resources.

Road access to new right-of-way would be planned and constructed to minimize erosion and sedimentation effects. Existing access points would be used whenever feasible. If no practicable alternative exists, trees along streams within the transmission line corridor and danger trees adjacent to the corridor would be cut; however, their stumps would not be removed and understory vegetation would be disturbed as little as possible. These initial clearing activities (including removal of danger trees) within SMZ areas along streams would be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., feller-buncher), which would result in minimal soil disturbance and damage to low-lying vegetation.

Under this alternative, TVA would be responsible for maintenance on that portion of the new line from the Five Points Substation to the edge of the SMEPA service Area (see Figure 1, sheet 2). During TVA transmission line maintenance activities, trees and other vegetation within the SMZ would be controlled with backpack-applied spot use herbicide to remove tree seedlings and other regrowth. Maintenance activities along streams would be by mechanical cutting or by selective use of USEPA-registered herbicides. Where herbicides are used, these chemicals would be applied following USEPA label restrictions and TVA BMPs.

Under the Action Alternative, as well as the No Action Alternative, SMEPA would retain responsibility for right-of-way maintenance on the 11.5-mile rebuild segment. In addition, SMEPA would be responsible for maintaining the right-of-way on the new line segment within the SMEPA service area (see Figure 1, sheet 2). As mentioned previously, SMZs are nonexistent along the entire length of the rebuild segment. Along this segment, water quality of streams crossing the right-of-way would continue to degrade. This could have cumulative impacts on sensitive aquatic species downstream of the right-of-way. These impacts include increased siltation due to the lack of a riparian buffer zone and the alteration of stream morphology by bulldozers, as well as depletion of dissolved oxygen due to elevated water temperatures and the high BOD associated with excessive algae growth.

Consistent with the measures outlined in Appendix B, TVA and its contractors typically avoid crossing streams with equipment during transmission line construction. Similarly, eroded access roads along the existing right-of-way would be returned to a serviceable condition and stabilized during construction. With these measures in place, potential cumulative effects to aquatic life from construction activities on the existing right-of-way would be minor and insignificant.

Suitable habitat for the Jackson Prairie crayfish occurs on the existing right-of-way. The presence of construction equipment in the area would not likely affect the Jackson Prairie crayfish, as it only leaves its burrow to forage at night when there would be no construction activity. This crayfish is sensitive to herbicides. Past right-of-way maintenance by SMEPA has been done by mowing and other mechanical means rather than with herbicides. Thus, adverse effects to the Jackson Prairie crayfish are unlikely.

4.3. Surface Water

Soil disturbances associated with access roads or other construction activities can potentially result in adverse effects to water quality. Soil erosion and sedimentation can clog small streams and threaten aquatic life. Removal of the tree canopy along stream crossings can increase water temperatures and enhance algal growth. Such situations can subsequently cause dissolved oxygen depletion and adversely affect aquatic biota. Improper use of herbicides to control vegetation can result in runoff to streams and subsequent aquatic impacts.

4.3.1. No Action Alternative

Under the No Action Alternative, the proposed project would not be undertaken, and construction would not occur. Under this alternative, SMEPA would continue to maintain its right-of-way, and water quality problems related to stream crossings may or may not continue, depending on SMEPA's right-of-way maintenance policies. However, adoption of the No Action Alternative would not result in any additional effects to surface water quality.

4.3.2. Action Alternative

TVA routinely includes precautions in the design, construction, and maintenance of its transmission line projects to minimize potential impacts to surface waters (see Appendices A, B, C, and D). Permanent stream crossings would be designed not to 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 requirements as described in Muncy (1999). Canopies in all SMZs would be left undisturbed unless there were no practicable alternative.

On the 4.5-mile-long portion of the new line where TVA would have maintenance responsibility for right-of-way maintenance, TVA would employ manual and low-impact methods wherever possible. In areas requiring chemical treatment, only USEPA-registered herbicides would be used in accordance with label directions designed in part to restrict applications in the vicinity of receiving waters and to prevent unacceptable aquatic impacts. Proper implementation of these controls is expected to result in only minor and temporary impacts to surface waters. No cumulative impacts are anticipated.

Appropriate measures (see Section 4.2.2 above) would be taken during construction on the new right-of-way to prevent water quality degradation. Thus, potential effects to surface water quality from the proposed construction on this segment of the transmission line are expected to be insignificant.

4.4. Wetlands

There are approximately 5.43 acres of wetlands in the proposed right-of-way that qualify as jurisdictional wetlands under the Clean Water Act. Five wetland areas totaling 2.48 acres lie along the 11.5-mile-long segment of existing right-of-way. Two wetland areas, WJB03 and WJB04 (2.58 and 0.37 acres, respectively) are located within the right-of-way of the proposed new line (see Table 6), and both are in the portion of the line that would be maintained by TVA.

Activities in wetlands are regulated under Sections 404 and 401 of the federal Clean Water Act. To conduct activities in wetlands, a nationwide general permit or an individual permit from the USACE is required. In addition, as a federal agency, TVA has a mandate to implement the provisions of EO 11990 (Protection of Wetlands). The federal "no-net-loss" policy for wetlands states an interim goal of no overall net loss of the nation's remaining wetlands, and the long-term goal of increasing the quality and quantity of the nation's wetlands (White House Office on Environmental Policy, 1993).

4.4.1. No Action Alternative

Approximately 2.48 acres of wetlands are located on right-of-way of the existing transmission line maintained by SMEPA. Under the No Action Alternative, SMEPA would continue to maintain this right-of-way, including the wetlands on it. No other wetlands are likely to be potentially affected by the adoption of the No Action Alternative.

4.4.2. Action Alternative

Clearing for the proposed new right-of-way would convert 0.37 acre of Category 1 forested wetlands (i.e., Wetland WJB04; see Table 6) to scrub-shrub or emergent habitat. Forested wetland clearing may be conducted under Nationwide Permit #12 under the condition that no mechanical clearing is to be done in the wetland. Wetland WJB03, a 2.58-acre scrub-shrub wetland, is also located within the right-of-way of the proposed transmission line. However, this wetland would be spanned by the line, and no clearing or conversion to another wetland type would be necessary. The remaining 2.48 acres of emergent wetlands on the existing right-of-way would be spanned by the transmission line, and these wetland areas would not be converted.

Implementation of BMPs for transmission line construction in wetland areas (Muncy, 1999) would reduce the potential for wetland impacts from soil disturbance and alterations to drainage and hydrology. Removal of vegetation in the forested Wetland WJB04 (0.37 acre) would decrease, to a limited degree, its value in terms of water quality and wildlife habitat functions. In addition, there would be minor secondary and cumulative impacts related to habitat fragmentation on a very small scale associated with clearing of forested wetlands. The limited habitat fragmentation associated with construction would be minimized by accessing the area from the grazed pasture on the west side of WJB03. Accessing the area by this route would also avoid any additional effects to Wetland WJB03.

Overall wetland impacts associated with this project would be insignificant. Approximately 0.37 acre of forested wetlands would be converted to scrub-shrub or emergent habitat. However, forested wetlands in the upper Leaf River watershed are in general much more common than in other areas of the TVA power service area, and the slight loss in function associated with conversion of 0.37 acre of forested wetlands is not considered significant. Potential wetland impacts on the remaining 5.06 acres of scrub-shrub and emergent wetlands would be minimized by using BMPs and by spanning these areas.

To compensate for the conversion of 0.37 acre of forested wetlands to other wetland types, TVA would purchase one credit from the Pearl River Mitigation Bank to meet USACE wetland mitigation requirements. These credits are based on a 2:1 mitigation ratio (i.e., two replacement acres per acre of impacted wetland). With this compensatory mitigation, potential effects to wetlands would be insignificant.

4.5. Groundwater

Construction activities, primarily spills, can cause potential effects to groundwater. Also, because right-of-way management involves the use of chemicals, such activities can potentially affect local groundwater quality.

4.5.1. No Action Alternative

Because construction of the new transmission line and rebuilding the existing line would not occur under the No Action Alternative, no effects to groundwater are expected if this alternative were adopted.

4.5.2. Action Alternative

BMPs as described in Muncy (1999) and the TVA guidelines for right-of-way management (see Appendix C) would be used by TVA to avoid potential impacts to groundwater. During revegetation and maintenance activities, fertilizers and herbicides would be used sparingly to avoid contamination of groundwater. With the use of BMPs and established guidelines, potential impacts to groundwater from TVA's proposed action would be insignificant.

4.6. Visual

Potential effects to visual resources were examined based on changes between the existing landscape and the landscape character after alteration, identifying changes in the landscape character based on commonly held perceptions of landscape beauty and the aesthetic sense of place. The potential effects to visual resources are described in the same manner as the existing visual resources, i.e., from west to east along the proposed route.

4.6.1. No Action Alternative

Under the No Action Alternative, the transmission line corridor and right-of-way would not be acquired, and the project would not be constructed. The existing scenic attractiveness would remain common to the area and the scenic integrity would remain moderate to low.

4.6.2. Action Alternative

As described in Section 3.6, some views of the proposed transmission line would be limited to positions, particularly roadways and road crossings, where views occur through breaks in vegetation. At other locations, the proposed line would cross open land and would be more visible.

The proposed route would traverse the rural Mississippi countryside covering ground that is sparsely inhabited, and infrequently crossed by major travelways. Temporary visual discord would be evident during the construction phases. This would be caused by the presence of heavy equipment and construction staging areas. This temporary alteration to the visual character would be minor and would not be noticeable after restoration. The existing landscape character and visual resources would be altered by the construction, operation, and maintenance of the proposed right-of-way, transmission line, and associated structures, which would increase the number of discordant elements in the landscape. However, the changes that would be visible after construction would not contribute to the loss of established landscape character or a degradation of the visual resources. Therefore, potential impacts to visual resources associated with this project would be insignificant.

4.7. Natural Areas

4.7.1. No Action Alternative

Under the No Action Alternative, the proposed action would not occur. No impacts are anticipated to occur to natural areas as a result of adopting this alternative.

4.7.2. Action Alternative

A portion of the proposed rebuild section of the transmission line is within Bienville National Forest. This segment is about 1.5 miles long and has a 100-foot-wide right-of-way. Thus, about 18.2 acres of Bienville National Forest is involved. TVA would contact staff of the Bienville Ranger District before the proposed action began to determine any additional environmental safeguards to protect resources on the Bienville National Forest. However, because the proposed action within forest boundaries is part of the rebuild section and no new right-of-way would be required, impacts to Bienville National Forest would be minimal and temporary and, therefore, are expected to be insignificant.

The proposed action is 1.6 miles southeast of Caney Creek WMA, 1.5 miles northwest of Tallahala WMA, 0.7 mile north of Durand Oak Prairie, and 1.5 miles northwest of Pinkston Hill Prairie. No impacts to these four managed areas or any ecologically significant sites are anticipated as a result of this alternative because of their distance from the proposed activities.

Because no NRI streams are within 3 miles of the proposed transmission line, no impacts to NRI streams are anticipated as a result of this alternative.

4.8. Recreation

4.8.1. No Action Alternative

Because there would be essentially no change from the current situation under the No Action Alternative, no potential effects to recreational facilities or opportunities are anticipated.

4.8.2. Action Alternative

Under this alternative, there could be some minor and temporary disruption or displacement of informal outdoor recreation (e.g., hunting, camping) during construction of the proposed line. Because such recreational opportunities are common in the area, any potential effects to recreation under this alternative are expected to be minor and insignificant.

4.9. Floodplains

4.9.1. No Action Alternative

Under the No Action Alternative, no construction or activities would occur within any floodplains. Thus, there would be effects to floodplains if this alternative were adopted.

4.9.2. Action Alternative

Under EO 11988, overhead lines and their support structures are considered repetitive actions within a floodplain. Location of structures in the floodplain is not anticipated to increase flood hazard. Implementation of BMPs during construction would help offset any adverse floodplain effects. Thus, construction of the proposed transmission line under the Action Alternative is not expected to cause any adverse effects to floodplains.

4.10. Cultural Resources

The cultural resources survey identified no historic properties within the APE of the proposed project. In an August 11, 2005, letter, the Mississippi State Historic Preservation Officer concurred with TVA's findings that no historic properties eligible for listing or currently listed on the NRHP would be affected (see Appendix F). Thus, no such cultural resources would be affected under either of the alternatives.

4.11. Other Potential Environmental Effects

Heavy equipment such as utility trucks would be used during construction. Exhaust emissions from engines would cause minor and temporary effects to air quality. Cleared vegetation would likely be piled and burned. Overall effects to air quality would be minor and insignificant. Solid waste would be produced. Metallic wastes would be recycled. Any other solid waste production is not expected to affect the capacity of local landfills. The proposed action would not disproportionately affect any minority or economically disadvantaged groups and would be consistent with EO 12898 (Environmental Justice).

4.12. Summary of TVA Commitments and Proposed Mitigation Measures

The following routine measures would be taken to reduce the potential for adverse environmental effects.

- Appropriate BMPs would be implemented during construction activities.
- During construction and operation of the proposed transmission line, the environmental quality protection specifications as described in Appendices A, B, C, and D of this document would be implemented.

The following nonroutine measures would be applied during construction and operation of the proposed transmission line to reduce the potential for adverse environmental effects.

- A group of climbing milkweed plants on the existing right-of-way would be avoided during construction activities.
- Two areas of Jackson Prairie that provide potential habitat for the Great Plains ladies'-tresses would be avoided during construction activities on the existing right-of-way.
- To reduce potential habitat fragmentation associated with construction and to avoid impacts to Wetland WJB03, access to the immediate area around this wetland area would be from the grazed pasture on the west side of WJB03.
- TVA would purchase one credit from the Pearl River Mitigation Bank to compensate for the conversion of 0.37 acre of forested wetland to scrub-shrub wetland or emergent wetland.

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CHAPTER 5

5. LIST OF PREPARERS

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CHAPTER 6

6. LIST OF AGENCIES AND PERSONS CONSULTED

Federal Agencies

U.S. Army Corps of Engineers
U.S. Department of Agriculture, Forest Service
U.S. Fish and Wildlife Service

State Agencies

Mississippi Department of Archives and History
Mississippi Department of Environmental Quality

Elected Officials and Local Organizations

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Terry Burton, Mississippi State Senate
Bennett Malone, Mississippi House of Representatives
Billy Nicholson, Mississippi House of Representatives
Tim Sorey, Board of Supervisors, Scott County, Mississippi
Billy Thames, Mississippi State Senate

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CHAPTER 7

7. SUPPORTING INFORMATION

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7.2. Glossary of Terms

ºF	abbreviation for degrees Fahrenheit
APE	acronym for Area of Potential Effect
BMP	acronym for best management practice
BOD	acronym for biological oxygen demand
CEPA	acronym for Central Electric Power Association
cfs	abbreviation for cubic feet per second
conductor	a cable or "wire" that carries electric current
confining unit	an underground layer of rock or other relatively impervious material that restricts the movement of groundwater
danger tree	a tree located outside the right-of-way, which if it fell, would come within 5 feet of the transmission line or a structure
distribution line	a line, usually lower voltage, that transmits electric power to a delivery point or end user
e.g.	abbreviation for the Latin term, *exempli gratia*, meaning "for example"
EO	acronym for Executive Order

et al.	abbreviation for the Latin term, *et alii* (masculine), *et aliae* (feminine), or *et alia* (neuter) meaning “and others”
Ibid	abbreviation for the Latin term, *ibidem*, meaning “in the same place;” refers to the immediately preceding author or work cited
i.e.	abbreviation for the Latin term, *id est*, meaning “that is”
kV	abbreviation for kilovolt
lignite	a type of soft coal
MDEQ	acronym for Mississippi Department of Environmental Quality
mesic	a habitat having a moderate amount of water
NEPA	acronym for National Environmental Policy Act
NRHP	acronym for National Register of Historic Places
NRI	acronym for Nationwide Rivers Inventory
outage	a period during which a transmission line or facility is out of service
palustrine	marshy or swamp-like; not part of a main water body
peaking generator	an electric generator used to supply power during periods of high demand
proclamation boundary	the boundary of the area within which the U.S. Forest Service may purchase land from willing sellers to add to a National Forest without additional Congressional approval
SMEPA	acronym for Southern Mississippi Electric Power Association
SMZ	acronym for streamside management zone
transmission line	a line, usually high-voltage, that carries (transmits) electric power from one location to another
TVA	acronym for the Tennessee Valley Authority
TVARAM	acronym for the Tennessee Valley Authority Rapid Assessment Method
U.S.	abbreviation for United States
US	abbreviation for U.S. Highway
USACE	acronym for U.S. Army Corps of Engineers
USEPA	acronym for U.S. Environmental Protection Agency

wet-weather conveyance	a stream that flows only following a rainfall
WMA	acronym for wildlife management area

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APPENDIX A – TVA RIGHT-OF-WAY CLEARING SPECIFICATIONS

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TVA RIGHT-OF-WAY CLEARING SPECIFICATIONS

1. General - The clearing contractor shall review the environmental evaluation documents (Categorical Exclusion Checklist, Environmental Assessment, or Environmental Impact Statement) for the project or proposed activity, along with all clearing and construction appendices, conditions in applicable general and/or site-specific permits, the storm water pollution prevention plan, and any Tennessee Valley Authority (TVA) commitments to property owners. The contractor shall then plan and carry out operations using techniques consistent with good engineering and management practices as outlined in TVA's Best Management Practice (BMP) manual (Muncy, 1992, and revisions thereto). The contractor will protect areas that are to be left unaffected by access or clearing work at and adjacent to all work sites. In sensitive areas and their buffers, the contractor will retain as much native ground cover and other vegetation as possible.

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

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

3. Land and Landscape Preservation - The clearing contractor shall exercise care to preserve the condition of cleared soils by avoiding as much compacting and deep scarring as possible. As soon as possible after initial disturbance of the soil and in accordance with any permit(s) or other state or local environmental regulatory requirements, cover material shall be placed to prevent erosion and sedimentation of water bodies or conveyances to surface water or groundwater. In areas outside the clearing, use, and access areas, the natural vegetation shall be protected from damage. The contractor and his employees must not deviate from delineated access routes or use areas, and must enter the site at designated areas that will be marked. Clearing operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the remaining natural vegetation and adjacent surroundings in the vicinity of the work. In sensitive public or environmental areas, appropriate buffer

zones shall be observed and the methods of clearing or reclearing modified to protect the buffer and sensitive area. Some areas may require planting native plants or grasses to meet the criteria of regulatory agencies or commitments to special program interests.

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

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

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

7. Water Quality Control - The contractor's clearing and disposal activities shall be performed using BMPs that will prevent erosion and entrance of spillage, contaminants, debris, and other pollutants or objectionable materials into drainage

ways, surface water, or groundwater. Special care shall be exercised in refueling equipment to prevent spills. Fueling areas shall be remote from any sinkhole, crevice, stream, or other water body. Open burning debris will be kept away from streams and ditches and shall be incorporated into the soil.

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

8. Turbidity and Blocking of Streams - If temporary clearing activities must interrupt natural drainage, appropriate drainage facilities and erosion/sediment controls shall be provided to avoid erosion and siltation of streams and other water bodies or water conveyances. Turbidity levels in receiving waters or at storm water discharge points shall be monitored, documented, and reported if required by the applicable permit. Erosion and sediment control measures such as silt fences, water bars, and sediment traps shall be installed as soon as practicable after initial access, site or right-of-way disturbance in accordance with applicable permit or regulatory requirements.

   Mechanized equipment shall not be operated in flowing water except when approved and, then, only to construct necessary stream crossings under direct guidance of TVA. Construction of stream fords or other crossings will only be permitted at approved locations and to current TVA construction access road standards. Material shall not be deposited in watercourses or within stream bank areas where it could be washed away by high stream flows. Any clearing debris that enters streams or other water bodies shall be removed as soon as possible. Appropriate U.S. Army Corps of Engineers and state permits shall be obtained for stream crossings.

9. Air Quality Control - The clearing or reclearing contractor shall take appropriate actions to limit the amount of air emissions created by clearing and disposal operations to well within the limits of clearing or burning permits and/or forestry or local fire department requirements. All operations must be conducted in a manner that prevents nuisance conditions or damage to adjacent land crops, dwellings, highways, or people.

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

11. Burning - The contractor shall obtain applicable permits and approvals to conduct controlled burning. The contractor will comply with all provisions of the permit, notification, or authorization including burning site locations, controlled draft, burning hours, and such other conditions as stipulated. If weather conditions such as wind speed or wind direction change rapidly, the contractor's burning operation may be

temporarily stopped by TVA's field engineer. The debris to be burned shall be kept as clean and dry as possible and stacked and burned in a manner that produces the minimum amount of smoke. Residue from burning will be disposed of according to permit stipulations. No fuel starters or enhancements other than kerosene will be allowed.

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

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

14. Vehicle Servicing - Routine maintenance of personal vehicles will not be performed on the right-of-way. However, if emergency or "have to" situations arise, minimal/temporary maintenance to personal vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Heavy equipment will be serviced on the right-of-way, except in designated sensitive areas. The clearing or reclearing contractor will properly maintain these vehicles with approved spill protection controls and countermeasures. If emergency maintenance in a sensitive or questionable area arises, the area environmental coordinator or construction environmental engineer will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.

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

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

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

18. Refuse Disposal - The clearing or reclearing contractor shall be responsible for daily cleanup and proper labeling, storage, and disposal of all refuse and debris on the site produced by his operations and employees. Facilities that meet applicable regulations

and guidelines for refuse collection will be required. Only approved transport, storage, and disposal areas shall be used.

19. Brush and Timber Disposal (Reclearing) - The reclearing contractor shall place felled tree boles in neat stacks at the edge of the right-of-way, with crossing breaks at least every 100 feet. Property owner requests shall be reviewed with the project manager or right-of-way specialist before accepting them. Lop and drop activities must be specified in the contract and on plan and profile drawings with verification with the right-of-way specialist before conducting such work. When tree trimming and chipping is necessary, disposal of the chips on the easement or other locations on the property must be with the consent of the property owner and the approval of the right-of-way specialist. No trees, branches, or chips shall remain in a surface water body or be placed at a location where washing into a surface water or groundwater source might occur.

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

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

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

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

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

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

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APPENDIX B – TVA ENVIRONMENTAL QUALITY PROTECTION SPECIFICATIONS FOR TRANSMISSION LINE CONSTRUCTION

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TENNESSEE VALLEY AUTHORITY ENVIRONMENTAL QUALITY PROTECTION SPECIFICATIONS FOR TRANSMISSION LINE CONSTRUCTION

1. General – Tennessee Valley Authority (TVA) and/or the assigned contractor shall plan, coordinate, and conduct operations in a manner that protects the quality of the environment and complies with TVA's environmental expectations discussed in the preconstruction meeting. This specification contains provisions that shall be considered in all TVA and contract construction operations. If the contractor fails to operate within the intent of these requirements, TVA will direct changes to operating procedures. Continued violation will result in a work suspension until correction or remedial action is taken by the contractor. Penalties and contract termination will be used as appropriate. The costs of complying with the Environmental Quality Protection Specifications are incidental to the contract work, and no additional compensation will be allowed. At all structure and conductor pulling sites, protective measures to prevent erosion will be taken immediately upon the end of each step in a construction sequence, and those protective measures will be inspected and maintained throughout the construction and right-of-way rehabilitation period.

2. Regulations - TVA and/or the assigned contractor shall comply with all applicable Federal, state, and local environmental and antipollution laws, regulations, and ordinances related to environmental protection and prevention, control, and abatement of all forms of pollution.

3. Use Areas - TVA and/or the assigned contractor's use areas include but are not limited to site office, shop, maintenance, parking, storage, staging, assembly areas, utility services, and access roads to the use areas. The construction contractor shall submit plans and drawings for their location and development to the TVA engineer and project manager for approval. Secondary containment will be provided for fuel and petroleum product storage pursuant to 29CFR1910.106(D)(6)(iii)(OSHA).

4. Equipment - All major equipment and proposed methods of operation shall be subject to the approval of TVA. The use or operation of heavy equipment in areas outside the right-of-way, access routes, or structure, pole, or tower sites will not be permitted without permission of the TVA inspector or field engineer. Heavy equipment use on steep slopes (greater than 20 percent) and in wet areas will be held to the minimum necessary to construct the transmission line. Steps will be taken to limit ground disturbance caused by heavy equipment usage, and erosion and sediment controls will be instituted on disturbed areas in accordance with state requirements.

   No subsurface ground-disturbing equipment or stump-removal equipment will be used by construction forces except on access roads or at the actual structure, pole, or tower sites, where only footing locations and controlled runoff diversions shall be created that disturb the soil. All other areas of ground cover or in-place stumps and roots shall remain in place. (Note: Tracked vehicles disturb surface layer of the ground due to size and function.) Some disking of the right-of-way may occur for proper seedbed preparation.

   Unless ponding previously occurred (i.e., existing low-lying areas), water should not be allowed to pond on the structure sites except around foundation holes; the water must be directed away from the site in as dispersed a manner as possible. At tower or

structure sites, some means of upslope interruption of potential overland flow and diversion around the footings should be provided as the first step in construction-site preparation. If leveling is necessary, it must be implemented by means that provide for continuous gentle, controlled, overland flow or percolation. A good grass cover, straw, gravel, or other protection of the surface must be maintained. Steps taken to prevent increases in the moisture content of the in-situ soils will be beneficial both during construction and over the service life of any structure.

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

6. Refuse Disposal - Designated TVA and/or contractor personnel shall be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced by his operations and by his employees. Suitable refuse collecting facilities will be required. Only state-approved disposal areas shall be used. Disposal containers such as dumpsters or roll-off containers shall be obtained from a proper waste disposal contractor. Solid, special, construction/demolition, and hazardous wastes as well as scrap are part of the potential refuse generated and must be properly managed with emphasis on reuse, recycle, or possible give away, as appropriate, before they are handled as waste. Contractors must meet similar provisions on any project contracted by TVA.

7. Landscape Preservation - TVA and its contractors shall exercise care to preserve the natural landscape in the entire construction area as well as use areas, in or outside the right-of-way, and on or adjacent to access roads. Construction operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural vegetation and surroundings in the vicinity of the work.

8. Sensitive Areas Preservation - Certain areas on site and along the right-of-way may be designated by the specifications or the TVA engineer as environmentally sensitive. These areas include but are not limited to areas classified as erodible, geologically sensitive, scenic, historical and archaeological, fish and wildlife refuges, water supply watersheds, and public recreational areas such as parks and monuments. Contractors and TVA construction crews shall take all necessary actions to avoid adverse impacts to these sensitive areas and their adjacent buffer zones. These actions may include suspension of work or change of operations during periods of rain or heavy public use; hours may be restricted or concentrations of noisy equipment may have to be dispersed. If prehistoric or historic artifacts or features are encountered during clearing or construction operations, the operations shall immediately cease for at least 100 feet in each direction, and TVA's right-of-way inspector or construction superintendent and Cultural Resources Program shall be notified. The site shall be left as found until a significance determination is made. Work may continue elsewhere beyond the 100-foot perimeter.

9. Water Quality Control - TVA and contractor construction activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing caves, sinkholes, streams, dry watercourses, lakes, ponds, and underground water sources.

   The clearing contractor will erect and (when TVA or contract construction personnel are unable) maintain Best Management Practices (BMPs) such as silt fences on steep slopes and adjacent to any stream, wetland, or other water body. Additional BMPs may be required for areas of disturbance created by construction activities. BMPs will be inspected by the TVA field engineer or other designated TVA or contractor personnel routinely and during periods of high runoff, and any necessary repairs will be made as soon as practicable. BMP inspections will be conducted in accordance with permit requirements. Records of all inspections will be maintained on site, and copies of inspection forms will be forwarded to the TVA construction environmental engineer.

   Acceptable measures for disposal of waste oil from vehicles and equipment shall be followed. No waste oil shall be disposed of within the right-of-way, on a construction site, or on access roads.

10. Turbidity and Blocking of Streams - Construction activities in or near SMZs or other bodies of water shall be controlled to prevent the water turbidity from exceeding state or local water quality standards for that stream. All conditions of a general storm water permit, aquatic resource alteration permit, or a site-specific permit shall be met including monitoring of turbidity in receiving streams and/or storm water discharges and implementation of appropriate erosion and sediment control measures.

    Appropriate drainage facilities for temporary construction activities interrupting natural site drainage shall be provided to avoid erosion. Watercourses shall not be blocked or diverted unless required by the specifications or the TVA engineer. Diversions shall be made in accordance with TVA's "A Guide for Environmental Protection and Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities."

    Mechanized equipment shall not be operated in flowing water except when approved and, then, only to construct crossings or to perform required construction under direct guidance of TVA. Construction of stream fords or other crossings will only be permitted at approved locations and to current TVA construction access road standards. Material shall not be deposited in watercourses or within stream bank areas where it could be washed away by high stream flows. Appropriate U.S. Army Corps of Engineers and state permits shall be obtained.

    Wastewater from construction or dewatering operations shall be controlled to prevent excessive erosion or turbidity in a stream, wetland, lake, or pond. Any work or placing of equipment within a flowing or dry watercourse requires the prior approval of TVA.

11. Clearing - No construction activities may clear additional site or right-of-way vegetation or disturb remaining retained vegetation, stumps, or regrowth at locations other than the structure sites and conductor setup areas. TVA and the construction contractor(s) must provide appropriate erosion or sediment controls for areas they have disturbed that have previously been restabilized after clearing operations. Control measures shall be

implemented as soon as practicable after disturbance in accordance with applicable Federal, state, and/or local storm water regulations.

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

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

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

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

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

13. Air Quality Control - Construction crews shall take appropriate actions to minimize the amount of air pollution created by their construction operations. All operations must be conducted in a manner that avoids creating a nuisance and prevents damage to lands, crops, dwellings, or persons.

14. Burning - Before conducting any open burning operations, the contractor shall obtain permits or provide notifications as required to state forestry offices and/or local fire departments. Burning operations must comply with the requirements of state and local air pollution control and fire authorities and will only be allowed in approved locations and during appropriate hours and weather conditions. If weather conditions such as wind direction or speed change rapidly, the contractor's burning operations may be temporarily stopped by the TVA field engineer. The debris for burning shall be piled and shall be kept as clean and as dry as possible, then burned in such a manner as to reduce smoke. No materials other than dry wood shall be open burned. The ash and debris shall be buried away from streams or other water sources and shall be in areas coordinated with the property owner.

15. Dust and Mud Control - Construction activities shall be conducted to minimize the creation of dust. This may require limitations as to types of equipment, allowable speeds, and routes utilized. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used subject to TVA's approval. On new construction sites and easements, the last 100 feet before an access

road approaches a county road or highway shall be graveled to prevent transfer of mud onto the public road.

16. Vehicle Exhaust Emissions - TVA and/or the contractors shall maintain and operate equipment to limit vehicle exhaust emissions. Equipment and vehicles that show excessive emissions of exhaust gasses and particulates due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective repairs or adjustments are made.

17. Vehicle Servicing - Routine maintenance of personal vehicles will not be performed on the right-of-way. However, if emergency or “have to” situations arise, minimal/temporary maintenance to personal vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Heavy equipment will be serviced on the right-of-way except in designated sensitive areas. The Heavy Equipment Department within TVA or the construction contractor will properly maintain these vehicles with approved spill prevention controls and countermeasures. If emergency maintenance in a sensitive or questionable area arises, the area environmental coordinator or construction environmental engineer will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.

18. Smoke and Odors - TVA and/or the contractors shall properly store and handle combustible material that could create objectionable smoke, odors, or fumes. The contractor shall not burn refuse such as trash, rags, tires, plastics, or other debris.

19. Noise Control - TVA and/or the contractor shall take measures to avoid the creation of noise levels that are considered nuisances, safety, or health hazards. Critical areas including but not limited to residential areas, parks, public use areas, and some ranching operations will require special considerations. TVA's criteria for determining corrective measures shall be determined by comparing the noise level of the construction operation to the background noise levels. In addition, especially noisy equipment such as helicopters, pile drivers, air hammers, chippers, chain saws, or areas for machine shops, staging, assembly, or blasting may require corrective actions when required by TVA.

20. Noise Suppression - All internal combustion engines shall be properly equipped with mufflers as required by the Department of Labor's "Safety and Health Regulations for Construction." TVA may require spark arresters in addition to mufflers on some engines. Air compressors and other noisy equipment may require sound-reducing enclosures in some circumstances.

21. Damages - The movement of construction crews and equipment shall be conducted in a manner that causes as little intrusion and damage as possible to crops, orchards, woods, wetlands, and other property features and vegetation. The contractor will be responsible for erosion damage caused by his actions and especially for creating conditions that would threaten the stability of the right-of-way or site soil, the structures, or access to either. When property owners prefer the correction of ground cover condition or soil and subsoil problems themselves, the section of the contract dealing with damages will apply.

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APPENDIX C – TVA TRANSMISSION CONSTRUCTION GUIDELINES NEAR STREAMS

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TENNESSEE VALLEY AUTHORITY TRANSMISSION CONSTRUCTION GUIDELINES NEAR STREAMS

Even the most carefully designed transmission line project eventually will affect one or more creeks, rivers, or other type of water body. These streams and other water areas are protected by state and Federal law, generally support some amount of fishing and recreation, and, occasionally, are homes for important and/or endangered species. These habitats occur in the stream and on strips of land along both sides (the streamside management zone [SMZ]) where disturbance of the water, land, or vegetation could have an adverse effect on the water or stream life. The following guidelines have been prepared to help Tennessee Valley Authority (TVA) Transmission Construction staff and their contractors avoid impacts to streams and stream life as they work in and near SMZs. These guidelines expand on information presented in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities."

Three Levels of Protection

During the preconstruction review of a proposed transmission line, TVA Environmental Stewardship and Policy staff will have studied each possible stream impact site and will have identified it as falling into one of three categories: (A) standard stream protection, (B) protection of important permanent streams, or C) protection of unique habitats. These category designations are based on the variety of species and habitats that exist in the stream as well as state and Federal requirements to avoid harming certain species. The category designation for each site will be marked on the plan and profile sheets. Construction crews are required to protect streams and other identified water habitats using the following pertinent set(s) of guidelines:

(A) Standard Stream Protection

This is the standard (basic) level of protection for streams and the habitats around them. The purpose of the following guidelines is to minimize the amount and length of disturbance to the water bodies without causing adverse impacts on the construction work.

Guidelines:

1. All construction work around streams will be done using pertinent Best Management Practices (BMPs) such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, Standards and Specifications.

2. All equipment crossings of streams must comply with appropriate state permitting requirements. Crossings of all drainage channels, intermittent streams, and permanent streams must be done in ways that avoid erosion problems and long-term changes in water flow. Crossings of any permanent streams must allow for natural movement of fish and other aquatic life.

3. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The

method will be selected based on site-specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. Stumps can be cut close to ground level but must not be removed or uprooted.

4. Other vegetation near streams must be disturbed as little as possible during construction. Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. Shorelines that have to be disturbed must be stabilized as soon as feasible.

(B) Protection of Important Permanent Streams

This category will be used when there is one or more specific reason(s) why a permanent (always-flowing) stream requires protection beyond that provided by standard BMPs. Reasons for requiring this additional protection include the presence of important sports fish (trout, for example) and habitats for Federal endangered species. The purpose of the following guidelines is to minimize the disturbance of the banks and water in the flowing stream(s) where this level of protection is required.

Guidelines:

1. Except as modified by guidelines 2-4 below, all construction work around streams will be done using pertinent BMPs such as those described in “A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities,” especially Chapter 6, Standards and Specifications.

2. All equipment crossings of streams must comply with appropriate state (and, at times, Federal) permitting requirements. Crossings of drainage channels and intermittent streams must be done in ways that avoid erosion problems and long-term changes in water flow. Proposed crossings of permanent streams must be discussed in advance with Environmental Stewardship and Policy staff and may require an on-site planning session before any work begins. The purpose of these discussions will be to minimize the number of crossings and their impact on the important resources in the streams.

3. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The method will be selected based on site-specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. Cutting of trees near permanent streams must be limited to those required to meet National Electric Safety Code and danger tree requirements. Stumps can be cut close to ground level but must not be removed or uprooted.

4. Other vegetation near streams must be disturbed as little as possible during construction. Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. Shorelines that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible.

(C) Protection of Unique Habitats

This category will be used when, for one or more specific reasons, a temporary or permanent aquatic habitat requires special protection. This relatively uncommon level of protection will be appropriate and required when a unique habitat (for example, a particular spring run) or protected species (for example, one that breeds in a wet-weather ditch) is known to occur on or adjacent to the construction corridor. The purpose of the following guidelines is to avoid or minimize any disturbance of the unique aquatic habitat.

Guidelines:

1. Except as modified by Guidelines 2-4 below, all construction work around the unique habitat will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, Standards and Specifications.

2. All construction activity in and within 30 meters (100 feet) of the unique habitat must be approved in advance by Environmental Stewardship and Policy staff, preferably as a result of an on-site planning session. The purpose of this review and approval will be to minimize impacts on the unique habitat. All crossings of streams also must comply with appropriate state (and, at times, Federal) permitting requirements.

3. Cutting of trees within 30 meters (100 feet) of the unique habitat must be discussed in advance with Environmental Stewardship and Policy staff, preferably during the on-site planning session. Cutting of trees near the unique habitat must be kept to an absolute minimum. Stumps must not be removed, uprooted, or cut shorter than 0.30 meter (1 foot) above the ground line.

4. Other vegetation near the unique habitat must be disturbed as little as possible during construction. The soil must not be disturbed by plowing, disking, blading, or grading. Areas that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible, in some cases with specific kinds of native plants. These and other vegetative requirements will be coordinated with Environmental Stewardship and Policy staff.

Additional Help

If you have questions about the purpose or application of these guidelines, please contact your supervisor or the environmental coordinator in the local Transmission Service Center.

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Comparison of Guidelines Under the Three Stream and Water Body Protection Categories (page 1)

Guidelines	A: Standard	B: Important Permanent Streams	C: Unique Water Habitats
1. Reference	• All TVA construction work around streams will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, BMP Standards and Specifications.	Except as modified by guidelines 2-4 below, all construction work around streams will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, BMP Standards and Specifications.	• Except as modified by guidelines 2-4 below, all construction work around the unique habitat will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, BMP Standards and Specifications.
2. Equipment Crossings	• All crossings of streams must comply with appropriate state and Federal permitting requirements. • Crossings of all drainage channels, intermittent streams, and permanent streams must be done in ways that avoid erosion problems and long-term changes in water flow. • Crossings of any permanent streams must allow for natural movement of fish and other aquatic life.	• All crossings of streams must comply with appropriate state and Federal permitting requirements. • Crossings of drainage channels and intermittent streams must be done in ways that avoid erosion problems and long-term changes in water flow. • Proposed crossings of permanent streams must be discussed in advance with Environmental Stewardship and Policy staff and may require an on-site planning session before any work begins. The purpose of these discussions will be to minimize the number of crossings and their impact on the important resources in the streams.	• All crossings of streams also must comply with appropriate state and Federal permitting requirements. • All construction activity in and within 30 meters (100 feet) of the unique habitat must be approved in advance by Environmental Stewardship and Policy staff, preferably as a result of an on-site planning session. The purpose of this review and approval will be to minimize impacts on the unique habitat.

Comparison of Guidelines Under the Three Stream and Water Body Protection Categories (page 2)

Guidelines	A: Standard	B: Important Permanent Streams	C: Unique Water Habitats
3. Cutting Trees	• Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The method will be selected based on site-specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. • Stumps can be cut close to ground level but must not be removed or uprooted.	• Cutting of trees with SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The method will be selected based on site-specific conditions and topography to minimize soil disturbance an impacts to the SMZ and surrounding area. • Cutting of trees near permanent streams must be limited to those meeting National Electric Safety Code and danger tree requirements. • Stumps can be cut close to ground level but must not be removed or uprooted.	• Cutting of trees within 30 meters (100 feet) of the unique habitat must be discussed in advance with Environmental Stewardship and Policy staff, preferably during the on-site planning session. Cutting of trees near the unique habitat must be kept to an absolute minimum. • Stumps must not be removed, uprooted, or cut shorter than 1 foot above the ground line.
4. Other Vegetation	• Other vegetation near streams must be disturbed as little as possible during construction. • Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. • Shorelines that have to be disturbed must be stabilized as soon as feasible.	• Other vegetation near streams must be disturbed as little as possible during construction. • Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. • Shorelines that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible.	• Other vegetation near the unique habitat must be disturbed as little as possible during construction. • The soil must not be disturbed by plowing, disking, blading, or grading. • Areas that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible, in some cases with specific kinds of native plants. These and other vegetative requirements will be coordinated with Environmental Stewardship and Policy staff

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APPENDIX D – TVA RIGHT-OF-WAY VEGETATION MANAGEMENT

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TENNESSEE VALLEY AUTHORITY RIGHT-OF-WAY VEGETATION MANAGEMENT

Tennessee Valley Authority (TVA) must manage 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 ensure National Electrical Safety Code electrical clearances between tall-growing vegetation and any other structures. Trees located off right-of-way trees that could fall or be cut into a transmission line are also very important.

These requirements are imperative to the maintenance of the transmission system and, in some cases, underbuilt distribution lines. It is seldom understood by customers or the general public that electricity must continuously be produced and transmitted on an instant-to-instant basis to serve the demand placed on the system by continuously changing electrical load. When a switch is turned on, electricity must flow instantaneously. With increasingly complex and diverse electronic equipment controlled by computers, microchips, and other systems that respond to microsecond interruptions, any disturbance on transmission or distribution lines instantaneously affects the overall reliability of critical devices, especially production devices; security systems; process controls; medical devices; water purification and sewage treatment systems; fire and safety protection systems; communication and control systems; etc. These systems have little tolerance of even a few microseconds of interruption.

Each year, TVA must assess the conditions of the vegetation on and along its rights-of-way. This is accomplished by aerial inspections of each line, periodic walking inspections, information from aerial photographs, information from TVA field personnel, property owners, and the general public. Information is developed regarding vegetation species present, the mix of species, the observed growth, the seasonal growing conditions, and the density of the tall vegetation. TVA also evaluates the proximity, height, and growth rate of trees that may be adjacent to the right-of-way and that may be a danger to the line or structures. TVA right-of-way program administrators develop a vegetation-reclearing plan that is specific to each line segment; it is based on terrain conditions, species mix, growth, and density. They evaluate accessibility, right-of-way, and adjacent sensitive areas, land use and development, and a series of additional parameters. To the maximum extent possible, line segments from substation busbar to substation busbar should be recleared in the same year so a line can be made as reliable as reasonably possible.

Complicating factors are the rich diversity of tall-growing and climbing vegetation species in the power service area. The long growing season with abundant rain greatly accelerates growth in the moderate to rich soils of the TVA power service area. In addition, many rapid growing species are accelerated growers when competing vegetation is removed or reduced. Diverse geographic features, slopes, and conditions along line easements create many sensitive environmental and public interest areas on or adjacent to rights-of-way.

For the above reasons, TVA uses an integrated vegetation management approach. In farming areas of right-of-way crops and pasture, TVA encourages property owner management of the right-of-way using low-growing crops year after year. In dissected terrain with rolling hills and interspersed woodlands traversed by the rights-of-way, TVA uses mechanical mowing to a large extent.

When slopes become hazardous to farm tractors and rotary mowers, TVA may use a variety of herbicides specific to the species present with a variety of possible application techniques. When scattered small segments of tall-growing vegetation are present but accessibility along the right-of-way is difficult or the path to such segments is very long compared to the amount present, herbicides may be used.

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. For that reason, TVA is actively looking at better control methods including use of low-volume herbicide applications, occasional singletree injections, and tree-growth regulators.

TVA does not encourage individual property owner tree reclearing activity 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. Private property owners may reclear the right-of-way with trained reclearing professionals.

TVA's experience initially was completely with hand clearing. World War II manpower shortages forced TVA to look toward developments in herbicide research. An era of near exclusive use of herbicides existed. Then, because of the discovery of residue accumulations with many pesticides and price increases of herbicides, high-volume applications lost favor, and TVA sought other modes of vegetation control. Farm equipment of greater power and efficiency allowed use of tractor-mounted rotary mowers. These mowers not only cut the tall saplings and seedlings on the right-of-way, they shatter the stump and the supporting near-surface root crown. The tendency of resistant species is to resprout from the root crown, and shattered stumps produce a multistem dense stand in the immediate area. Repeated use of the mowers on short-cycle reclearing with many original stumps regrowing in the above manner creates a single-species thicket or monoculture. With the original large root system and multiple stems, the resistant species can and usually do produce regrowth 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 created, 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. They tend to spread off the right-of-way into more desirable species areas. Increasingly, TVA is receiving complaints about the shatter sapling debris density. The potential exists for insect invasion or fungus infection resulting from the easy invasion of damaged specimens or debris. Once started, such infestations or invasions can spread into valuable timber of the same or related species off the right-of-way.

Therefore, TVA has been working with universities (such as Mississippi State University, University of Tennessee, Purdue University, and others), chemical companies, other utilities, and personnel of the U.S. Department of Transportation, U.S. Fish and Wildlife Service, and U.S. Forest Service to explore other means of dealing with problem vegetation. The results have been 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.

The above-named universities strongly recommend low-volume herbicide applications since their research demonstrates much wider plant diversity after such applications. They report better ground erosion protection and the development of more wildlife food plants and cover plants. In most situations, there is increased development of wild flowering plants and shrubs. In conjunction with herbicides, the diversity and density of low-growing plants provide control of tall-growing species through competition.

Wildlife managers are specifically requesting the use of herbicides in place of rotary mowing in order to avoid damage to nesting and tunneling wildlife. This method retains groundcover year-round 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).

Property owners interested in tree production are requesting use of low-volume applications rather than hand or mechanical clearing because of the insect and fungus problems in damaged vegetation and debris left on rights-of-way. The insect and fungus invasions such as pine tip moth, oak leaf blight, sycamore and dogwood blight, etc., are becoming widespread across the nation.

Some property owners have special interests. In those cases, TVA attempts to work with them to either have them sign agreements in which they maintain the right-of-way in right-of-way crops or pasture or they do the actual right-of-way maintenance. Some may choose to use low-growing trees or fruit trees, sod, vegetable crops, or other low vegetation types.

TVA discusses with property owners the potential to sign an agreement to manage their land for wildlife under the auspices of "Project Habitat," a joint TVA/American Cyanamid wildlife organization. The property owner maintains the right-of-way in wildlife food and cover with emphasis on quail, turkey, deer, or related forms. A variation used in or adjacent to developing suburban areas is to sign agreements with the developer and residents to plant and maintain wildflowers on the right-of-way.

TVA places strong emphasis on developing rights-of-way in the above manner. When the property owners do not agree to these opportunities, TVA must maintain the right-of-way in the most environmentally acceptable, cost and vegetation effective and efficient manner possible.

Approved Herbicides for Usage on TVA Rights-of-Way

Trade Name	Active Ingredients	Label Signal Word
Accord	Glyphosate/Liquid	Caution
Arsenal	Imazapyr/Liquid/Granule	Caution
Escort	Metsulfuron Methyl/dry flowable	Caution
Garlon	Triclopyr/Liquid	Caution
Garlon 3A	Triclopyr/Liquid	Danger
Diuron	Diuron/Flowable powder	Caution
Spike 40P	Tebuthiuron/Pellet	Caution
Spike 80W	Tebuthiuron/Wettable powder	Caution
Transline	Clopyralid/Liquid	Caution
Pathfinder II	Triclopyr/RTU	Caution
Krenite UT	Fosamine Ammonium	Warning
Vanquish	Diglycolamine	Caution

Approved Herbicides for Bare Ground Areas

Trade Name	Active Ingredients	Label Signal Word
Chopper	Imazapyr/RTU	Caution
Topsite	Diuron/Imazapyr	Caution
Roundup	Glyphosate/Liquid	Caution
SpraKil SK-26	Tebuthiuron and Diuron	Caution
Sahara	Diuron/Imazapyr	Caution
Roundup Pro	Glyphosate	Caution
Endurance	Prodiamine	Caution
Predict	Norflurazon	Caution

Tree growth regulators (TGRs) are being considered for use on tall trees that have special circumstances where they must be trimmed on a regular cycle.

Approved TGRs for Use on TVA Property

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

The herbicide Pathway is being considered for use following initial clearing. Test plots have been established to determine the effectiveness of Pathway. Pathway is a mix of Picloram and 2,4-D and carries a "Warning" signal word.

These herbicides have been evaluated in extensive studies at universities in support of registration applications and label requirements. Most have been reviewed in the U.S. Forest Service (USFS) Vegetation Management Environmental Impact Statements (EISs), and those evaluations are incorporated here by reference. 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 to resources (including buffer zones for listed threatened or endangered species) when applied by trained applicators following the label and registration procedures.

Those not addressed in the USFS EISs or their supporting research have been peer reviewed in university research, addressed in U.S. Environmental Protection Agency (USEPA) literature reviews, or are discussed in documents on file at USEPA and U.S. Fish and Wildlife Service libraries. On the basis of this literature and TVA's reviews, the approved list above has been compiled and is reviewed again each year as new information is published.

The rates of application utilized are those listed on the USEPA-approved label and consistent with the revised application rates of the USFS Vegetation Management EIS Record of Decision. These typical application rates, in pounds/acre of active ingredient, are as follows:

Herbicide	Application Method					
	Aerial Liquid	Aerial Granule	Mechanical Liquid	Mechanical Granule	Manual Hand	Manual Foliar
2,4-D amine	2.0		2.5			2.0
2.4-D ester	2.5		4.0			2.0
2.4-DP	3.0		4.0			1.0
Dicamba			2.0			2.0
Krenite	6.0		7.8			
Glyphosate	1.5		1.5			1.0
Hexazinone	4.0	4.0	4.0	4.0	4.0	4.0
Imazapyr	0.75		0.75			0.75
Fuel oil	0.5		2.0			1.5
Limonene	0.9		0.9			0.9
Picloram	0.5		0.7			0.4
Sulfomet	0.13		0.17			0.06
Tebuthiuron	1.0	1.0	1.0	1.0		4.0
Triclopyr amine	4.0		4.0			4.0
Triclopyr ester	4.0		4.0			4.0

TVA currently uses primarily low-volume applications of foliar and basal applications of Accord (Glyphosate) and Accord (Glyphosate)-Arsenal (Imazapyr) tank mixes. Glyphosate is one of the most widely used herbicidal active ingredients in the world and has been continuously the subject of numerous exhaustive studies and scrutiny to determine its potential impacts on humans, animals, and the environment.

Accord, labeled for vegetation management in forestry and utility rights-of-way applications, has a full aquatics label and can be applied to emergent weeds in all bodies of fresh and brackish water. There is no restriction on the use of treated water for irrigation, recreation, or domestic purposes.

Accord is applied to the foliage of actively growing plants. The active ingredient is absorbed through the leaves and rapidly moves throughout the plant. Glyphosate prevents the plant from producing amino acids that are unique to plants and are building blocks of plant proteins. The plant, unable to make proteins, stops growing and dies.

The favorable environmental fate characteristic of Accord herbicide and its major metabolite (breakdown product) aminomethylphosphonic acid (AMPA) is well known. Continuing research is underway with more than 400 studies conducted to date in the laboratory and under field use conditions. These studies show rapid breakdown, little soil or plant debris retention, and little vertical movement into soil below the surface.

Glyphosate is naturally degraded by microbes in soil and water under both aerobic (with oxygen) and anaerobic (without oxygen) conditions. AMPA is further degraded in soil and sediments to phosphorus, nitrogen, hydrogen, and carbon dioxide. Glyphosate binds

rapidly and completely to a wide range of soils and sediment when introduced into the environment. This essentially eliminates movement in the soil. The average half-life of glyphosate in soils is less than 45 days. Half-life for the dissipation of glyphosate in environmental waters ranges from 1.5 to 14 days.

Glyphosate is nontoxic to birds, mammals, and bees and has been shown not to bioaccumulate since it acts in plants through an enzyme system that does not exist in animals or humans.

Arsenal (Imazapyr) has been similarly tested, and it is found to have low-leaching potential in soils. When available on or in the soil, it is broken down rapidly by soil microbes to naturally occurring compounds. When not available, Imazapyr is bound tightly to soil colloids and is unavailable for movement. The half-life in soil is 25 to 65 days.

Extensive chronic and acute toxicity studies have made Arsenal a USEPA-classified herbicide as practically nontoxic to humans, mammals, birds, fish, aquatic invertebrates, and insects. The chronic studies demonstrate that Imazapyr is non-teratrogenic, non-mutagenic, and not a carcinogen.

The mode of action suppresses amino acids of the plant via an enzyme system containing acetohydroxy acid synthase. This enzyme system does not exist in other forms of life including humans and animals.

Revision July 2003

APPENDIX E – COMMON AND REPRESENTATIVE PLANT SPECIES OBSERVED ALONG THE PROPOSED FIVE POINTS-HOMEWOOD TRANSMISSION LINE PROJECT ROUTE

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Common and Representative Plant Species Observed Along the Proposed Five Points-Homewood Transmission Line Project Route

(Species are arranged alphabetically by common name)

Common Name	Scientific Name	Plant Community[1]
Alabama supple-jack	*Berchemia scandens* (J. Hill) K. Koch	BH, ES, MH, JP, P
American beech	*Fagus grandifolia* Ehrh.	MH
American elder	*Sambucus canadensis* L.	S/W
American elm	*Ulmus americana* L.	BH, MH, P
American holly	*Ilex opaca* Soland. in Ait.	BH, MH, P
American hornbeam	*Carpinus caroliniana* Walt.	BH
Annual ragweed	*Ambrosia artemisiifolia* L.	ES
Annual sumpweed	*Iva annua* L.	ES
Bahia grass	*Paspalum notatum* Fluegge	ES, L
Balloonvine	*Cardiospermum halicacabum* L.	S/W
Bermudagrass	*Cynodon dactylon* (L.) Pers.	ES, L
Big bluestem	*Andropogon gerardii* Vitman	ES
Black cherry	*Prunus serotina* Ehrh.	BH, ES, MH, P
Black-eyed susan	*Rudbeckia hirta* L.	ES, JP
Black gum	*Nyssa sylvatica* Marsh.	BH, ES, MH, P
Black willow	*Salix nigra* Marsh.	S/W
Blunt spikerush	*Eleocharis obtusa* (Willd.) J.A. Schultes	S/W
Box elder	*Acer negundo* L.	BH
Brazilian vervain	*Verbena brasiliensis* Vell.	ES, JP
Broom sedge	*Andropogon virginicus* L.	ES
Buckthorn bumelia	*Bumelia lycioides* (L.) Pers.	MH, JP, P
Bur oak	*Quercus macrocarpa* Michx.	BH
Bush aster	*ster dumosus* L.	ES
Butterfly milkweed	*Asclepias tuberosa*	ES
Canada goldenrod	*Solidago canadensis* L.	ES
Canada horseweed	*Conyza canadensis* (L.) Cronq.	ES
Canadian black-snakeroot	*Sanicula canadensis* L.	BH, MH, P
Carolina anglepod	*Matalea carolinensis* (Jacq.) Wood	ES
Carolina bristly-mallow	*Modiola caroliniana* G. Don	L
Carolina buckthorn	*Rhamnus caroliniana* Walt.	JP
Carolina coral-beads	*Cocculus carolinus* (L.) DC.	JP
Carolina elephantfoot	*Elephantopus carolinianus* Raeusch.	BH, ES
Carolina pony-foot	*Dichondra caroliniensis* Michx.	ES, L
Cat greenbriar	*Smilax glauca* Walt.	ES, MH, P
Cespitose smartweed	*Polygonum cespitosum* Blume	ES
Cherokee sedge	*Carex cherokeensis* Schw.	BH, MH, JP, P
Cherrybark oak	*Quercus pagoda* Raf.	BH, MH, P
Chickasaw plum	*Prunus angustifolia* Marsh.	JP
Chinaberrytree	*Melia azedarach* L.	BH
Chinese bushclover	*Lespedeza cuneata* (Dum. Cours.) G. Don	ES
Chinese privet	*Ligustrum sinense* Lour.	BH, MH, JP, P
Chinese tallow tree	*Sabium sebiferum* (L.) Roxb.	BH, ES, MH, P
Chinkapin oak	*Quercus muhlenbergii* Engelm.	JP
Cinnamon fern	*Osmunda cinnamomea* L.	S/W
Climbing hempweed	*Mikania scandens* (L.) Willd.	S/W
Climbing milkweed	*Matalea obliqua* (Jacq.) Woods	ES
Cogon grass	*Imperata cylindrica* (L.) Beauv.	ES, P
Columbia waxweed	*Cuphea carthagenensis* (Jacq.) J.F.Macgr.	ES
Common boneset	*Eupatorium perfoliatum* L.	S/W

Common Name	Scientific Name	Plant Community[1]
Common buttonbush	*Cephalanthus occidentalis* L.	S/W
Common greenbriar	*Smilax rotundifolia* L.	BH, ES, MH, P
Common pawpaw	*Asimina triloba* (L.) Dunal	BH, MH, P
Common persimmon	*Diospyrus virginiana* L.	BH, MH, P
Common pokeweed	*Phytolacca americana* L.	ES
Common selfheal	*Prunella vulgaris* L.	ES
Common yellow woodsorrel	*Oxalis stricta* L.	ES, L
Crossvine	*Bignonia capreolata* L.	BH, MH, P
Curly dock	*Rumex crispus* L.	ES
Cypress witch grass	*Dichanthelium dichotomum* (L.) Gould	BH, MH, P
Deciduous holly	*Ilex decidua* Walt.	BH, MH, P
Dotted smartweed	*Polygonum punctatum* Ell.	ES
Durand's white oak	*Quercus durandii* Buckley	JP
Dwarf palmetto	*Sabal minor* (Jacq.) Pursh	BH, S/W
Eastern cottonwood	*Populus deltoides* W.Bartram ex Marsh.	BH
Eastern false willow	*Baccharis halimifolia* L.	ES
Eastern gama grass	*Tripsacum dactyloides* (L.) L.	ES
Eastern purple coneflower	*Echinacea purpurea* (L.) Moench.	JP
Eastern redbud	*Cercis canadensis* L.	JP, MH, P
Eastern red cedar	*Juniperus virginiana* L.	JP, MH, P
Ebony spleenwort	*Asplenium platyneuron* (L.) Oakes	MH, P
Egg-leaf Indian-plantain	*Arnoglossum ovatum* (Walt.) H. Rob.	S/W
Elliott blueberry	*Vaccinium elliottii* Chapm.	BH
False indigo-bush	*Amorpha fruticosa* L.	S/W
Field garlic	*Allium vineale* L.	ES
Field paspalum	*Paspalum laeve* Michx.	ES
Flat-topped fragrant golden-rod	*Euthamia graminifolia* (L.) Nutt.	ES
Floating seedbox	*Ludwigia peploides* (H.B.K.) Raven	S/W
Flowering dogwood	*Cornus florida* L.	MH, P
Giant cane	*Arundinaria gigantea* (Walt.) Walt. ex Muhl.	BH, S/W
Grain sorghum	*Sorghum vulgare* Pers.	ES
Green ash	*Fraxinus pennsylvanica* Marsh.	BH, MH, P
Green-flowered Milkweed	*Asclepias viridis* Walt.	ES, JP
Hairy buttercup	*Ranunculus sardous* Crantz	ES
Hairy elephantfoot	*Elephantopus tomentosus*	ES, MH, P
Heart-leaf peppervine	*Ampelopsis cordata* Michx.	MH, P
India goosegrass	*Eleusine indica* (L.) Gaertn.	ES, L
Indian sea oats	*Chasmanthium latifolium* (Michx.) H. Yates	BH, ES, S/W
Japanese climbing fern	*Lygodium japonicum* (Thunb.) Swartz	ES, MH, P
Japanese honeysuckle	*Lonicera japonica* Thunb.	BH, JP, MH, P
Johnson grass	*Sorghum halepense* (L.) Pers.	ES
Late-flowering thoroughwort	*Eupatorium serotinum* Michx.	ES
Late purple aster	*Aster patens* Ait.	ES
Lax-flower witch grass	*Dichanthelium laxiflorum* (Lam.) Gould	ES, MH, P
Leathery rush	*Juncus coriaceus* Mackenz.	ES, S/W
Little bluestem	*Schizachyrium scoparium* (Michx.) Nash	ES, JP
Little brown jug	*Asarum arifolium* Michx.	BH, MH
Loblolly pine	*Pinus taeda* L.	BH, MH, P
Long-awn muhly	*Muhlenbergia capillaris* (Lam.) Trin.	ES
Long-leaf spikegrass	*Chasmanthium sessiliflorum* (Poir.) H.Yates	BH, ES, MH, P
Marshpepper smartweed	*Polygonum hydropiperoides* Michx.	S/W
Muscadine grape	*Vitis rotundifolia* Michx.	BH, MH, P

Common Name	Scientific Name	Plant Community[1]
Nimble-will	*Muhlenbergia schreberi* J.F.Gmel.	ES, L
Oldfield golden-rod	*Solidago nemoralis* Ait.	ES
Osage orange	*Maclura pomifera* (Raf.) C.R. Schneid.	JP
Overcup oak	*Quercus lyrata* Walt.	BH, S/W
Partridge-berry	*Mitchella repens* L.	BH
Partridge pea	*Cassia fasciculata* Michx.	ES
Pecan	*Carya illinoensis* (Wangenh.) K. Koch	BH, MH, P
Peppervine	*Ampelopsis arborea* (L.) Koehne	BH, ES, MH, P
Pinnate prairie coneflower	*Ratibida pinnata* (Vent.) Barnhart	JP
Poison ivy	*Toxicodendron radicans* (L.) Kuntze	BH, ES, JP, MH, P
Post oak	*Quercus stellata* Wangenh.	MH, P
Prairie bundle-flower	*Desmanthus illinoensis* (Michx.) Macmil. ex B.Rob. & Fernald	JP
Purple lovegrass	*Eragrostis spectabilis* (Pursh) Steud.	ES
Purple prairie-clover	*Dalea purpurea* Vent.	JP
Purple-top tridens	*Tridens flavus* (L.) A. Hitchc.	ES
Racemed milkwort	*Polygala polygama* Walt.	JP
Red buckeye	*Aesculus pavia* L.	BH, MH, P
Red maple	*Acer rubrum* L.	BH, MH, P
Red-top panic grass	*Panicum rigidulum* Bosc. ex Nees	ES
Redvine	*Brunnichia ovata*	BH, S/W
Resurrection fern	*Pleopeltis polypodioides* (L.) E.G. Andrews & Windham	BH, JP, MH, P
Rice cutgrass	*Leersia oryzoides* (L.) Swartz	S/W
Rough buttonweed	*Diodia teres* Walt.	ES, L
Rough-leaf dogwood	*Cornus drummondii* C.A. Meyer	BH, JP, MH, P
Royal fern	*Osmunda regalis* L.	S/W
Rusty blackhaw	*Viburnum rufidulum* Raf.	JP, MH, P
Sassafras	*Sassafras albidum* (Nutt.) Nees	MH, P
Saw greenbrier	*Smilax bona-nox* L.	BH, MH, P
Serrate-leaf blackberry	*Rubus argutus* Link	ES, JP, MH, P
Shallow sedge	*Carex lurida* Wahlenb.	S/W
Slender rush	*Juncus tenuis*Willd.	ES, L
Slender spikegrass	*Chasmanthium laxum* (L.) H. Yates	BH, ES, MH, P
Small dog fennel thoroughwort	*Eupatorium capillifolium* (Lam.) Small	ES
Small-flower white morning-glory	*Ipomoea lacunosa* L.	ES, S/W
Small-spike false-nettle	*Boehmaria cylindrica* (L.) Swartz	BH, S/W
Smooth crabgrass	*Digitaria ischaemum*	ES, L
Smooth sumac	*Rhus glabra* L.	ES
Soft rush	*Juncus effusus* L.	ES, S/W
Southern bayberry	*Myrica cerifera* L.	BH, MH, P, S/W
Southern carpet grass	*Axonopus affinis* Chase	ES, L
Southern crabgrass	*Digitaria ciliaris*	ES, L
Southern dewberry	*Rubus trivialis* Michx.	ES
Southern shagbark hickory	*Carya carolinae-septrionalis* (Ashe) Engler & Grabner	BH, MH, P
Sparkleberry	*Vaccinium arboreum* Marshall	ES, MH, P,
Spiny amaranth	*Amaranthus spinosus* L.	ES
Spotted water-hemlock	*Cicuta maculata* L.	S/W
Subartic lady fern	*Athyrium filix-femina* (L.) Roth	BH, S/W
Sugarberry	*Celtis laevigata* Willd.	BH, MH, P

Common Name	Scientific Name	Plant Community[1]
Sugar cane plumegrass	*Erianthus giganteus* (Walt.) F.T.Hubb. non Muhl.	S/W
Summer grape	*Vitis aestivalis* Michx.	BH, MH, P
Swamp chestnut oak	*Quercus michauxii* Nutt.	BH
Swamp sunflower	*Helianthus angustifolius* L.	ES
Sweetbay magnolia	*Magnolia virginiana* L.	BH, S/W
Sweet gum	*Liquidambar styraciflua* L.	BH, MH, P
Sweet pignut hickory	*Carya glabra* (Mill.) Sweet	BH, MH, P
Switch grass	*Panicum virgatum* L.	ES
Tall fescue	*Festuca arundinacea* L.	ES, L
Tall ironweed	*Vernonia gigantea* (Walt.) Trelease	ES
Trumpet creeper	*Campsis radicans* (L.) Seem.	BH, MH, P
Tuberous vervain	*Verbena rigida* Spreng.	ES, JP
Tulip tree	*Liriodendron tulipifera* L.	MH, P
Variable witch grass	*Dichanthelium commutatum* (J.A. Schultes) Gould	BH, ES, MH, P
Vasey grass	*Paspalum urvillei* Steud.	ES
Virginia buttonweed	*Diodia virginiana* L.	ES, L
Virginia dayflower	*Commelina virginica* L.	BH, S/W
Virginia wild-rye	*Elymus virginicus* L.	BH, JP, MH, P,
Water oak	*Quercus nigra* L.	BH, MH, P
White avens	*Geum canadense* Jacq.	BH, ES, MH, P
White clover	*Trifolium repens* L.	ES, L
White crownbeard	*Verbesina virginica* L.	ES, S/W
Whitegrass	*Leersia virginica* Willd.	BH, ES, S/W
White oak	*Quercus alba* L.	MH, P
Wild bergamot	*Monarda fistulosa* L.	ES
Wild sweet-potato vine	*Ipomoea pandurata* (L.) G.F.W. Meyer	ES, MH, P
Willow oak	*Quercus phellos* L.	BH, MH, P
Winged elm	*Ulmus alata* Michx.	BH, MH, P
Winged sumac	*Rhus copallinum* L.	ES, MH, P
Witch grass	*Panicum capillare* L.	ES
Woodland sedge	*Carex blanda* Dewey	BH, MH, P
Wool-rush	*Scirpus cyperinus* (L.) Kunth	S/W
Yellow bristle grass	*Setaria glauca* (L.) Beauv.	ES
Yellow indiangrass	*Sorghastrum nutans* (L.) Nash	ES, JP
Yellow jessamine	*Gelsemium sempervirens* (L.) W.T. Ait.	MH, P
Yellow-puff	*Neptunia lutea* (Leavenw.) Benth.	JP

[1] Plant community abbreviations: BH = bottomland hardwood forest; ES = early successional habitat; JP = Jackson Prairie; L = lawn; MH = mesic hardwood forest; P = pine forest; and S/W = streams and associated wetland. See text (Section 3.1.1, above) for a description of these plant communities in the project area.

APPENDIX F – CORRESPONDENCE

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MISSISSIPPI Department of
MDAH
ARCHIVES & HISTORY

HISTORIC PRESERVATION
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August 11, 2005

Mr. Richard Yarnell
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902-1401

Dear Mr. Yarnell:

RE: Phase I Cultural Resources Survey for the proposed 17 mile Five Points-Homewood transmission line, Scott County, report #05-245

We have reviewed the August 2005, cultural resources survey report of TRC for the above referenced undertaking. No sites or properties listed in or eligible for listing in the National Register of Historic Places will be affected. We, therefore, have no further reservations with this undertaking.

In addition, we are not aware of any potential of this undertaking to affect Indian cultural or religious sites. However, if you require confirmation of this, the tribal entities will have to be contacted directly.

There remains a very remote possibility that unrecorded cultural resources may be encountered during construction. If this occurs, we would appreciate your contacting this office immediately in order that we may offer appropriate comments under 36 CFR 800.13 within forty-eight hours. Your continued cooperation is appreciated.

Sincerely,

H. T. Holmes
State Historic Preservation Officer

Thomas H. Waggener

By: Thomas H. Waggener
Review and Compliance Officer

cc: Clearinghouse for Federal Programs

43910-2006-I-0088

TVA

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1401

February 6, 2006

RECEIVED
FEB 09 2006
By MS Field Office

Mr. Ray Aycock, Field Supervisor
U.S. Fish and Wildlife Service
6578 Dogwood View Parkway
Jackson, Mississippi 39213

Dear Mr. Aycock:

INFORMAL CONSULTATION – HOMEWOOD TRANSMISSION LINE, SCOTT COUNTY, MISSISSIPPI

The Tennessee Valley Authority (TVA) proposes to construct a new 161-kilovolt (kV) transmission line in Scott County, Mississippi. The new line would consist of two segments. The first segment would be approximately 6 miles long and would be built on new right-of-way from the Five Points Substation to a point near the Lake Substation south of Lake, Mississippi. The second segment would extend from this point to the Homewood Substation, near Homewood, Mississippi. This second segment would be built on existing right-of-way currently occupied by a 69-kV transmission line and would be approximately 11.5 miles long. On this segment, TVA proposes to construct a new 161-kV line and rebuild the 69-kV line. These two lines would share new structures. Maps showing the preferred route are enclosed.

Review of the TVA databases indicated that red-cockaded woodpeckers (*Picoides borealis*) have been reported from Scott, Newton, and Smith Counties. Further review revealed that a colony had been reported adjacent to the existing right of way.

Field surveys were conducted in June 2005. The project is located in a mixture of forested and open habitats. The portion of the line near a reported red-cockaded woodpecker colony is forested but is currently dominated by hardwoods (see Photo 1). Although suitable habitat for red-cockaded woodpeckers was observed in the vicinity, no evidence of an existing colony or suitable habitat was visible from the right-of-way or from adjacent woodland parcels.

No suitable red-cockaded woodpecker habitat would be removed along this portion of the existing right-of-way corridor. Only small saplings that have encroached into the right of way would be removed (note habitat in enclosed photo). Based upon results of field surveys, TVA has concluded that its proposed action would not result in impacts to red-cockaded woodpeckers. TVA requests your concurrence with this finding.

[ ] No significant adverse wetland impacts
[ ] No listed, proposed or candidate species present

Environmental Coordinator
U.S. Fish and Wildlife Service

Log No: 06-147 Date: 2/10/06

Thank you for your assistance. Please contact Travis Henry at (865) 632-6360 or e-mail address thhenry@tva.gov if you need additional information.

Sincerely,

Jon M. Loney
Manager, NEPA Administration
Environmental Policy and Planning

Enclosure