

**FINDING OF NO SIGNIFICANT IMPACT**  
**TENNESSEE VALLEY AUTHORITY**  
BRADLEY 500-KV SUBSTATION AND TRANSMISSION LINE -  
SOUTHEAST AREA POWER IMPROVEMENT PROJECT  
HAMILTON COUNTY AND BRADLEY COUNTY, TENNESSEE  
AND CATOOSA COUNTY, GEORGIA

**The Proposed Action**

Tennessee Valley Authority (TVA) proposes to construct a new 500-kilovolt (kV) substation and the associated transmission line connections in Bradley County, Tennessee. TVA also proposes to expand the Concord Substation by 1.8 acres to add capacitor banks, rebuild and add new conductors to four existing transmission lines, rearrange transmission connections, and make power control and quality improvements at several local plant switchyards and substations in Hamilton County and Bradley County, Tennessee, areas and in a portion of Catoosa County, Georgia. The rebuilt section of transmission line would be constructed with double-pole steel structures on 4.7 miles of right-of-way ranging from 100 to 150 feet in width. The 500-kV transmission line connection to the Bradley 500-kV Substation would be constructed using self-supporting, galvanized, laced-steel structures on new right-of-way 300 feet in width. In addition, three new 161-kV transmission line connections to the Bradley 500-kV Substation would be constructed with a combination single-pole and double-pole (H-frame) steel structures on new right-of-way ranging from 100 to 137.5 feet in width. The proposed Bradley 500-kV Substation site and associated 161-kV and 500-kV transmission line connections would occupy approximately 72 acres. TVA has prepared an Environmental Assessment (EA) that is incorporated by reference.

**Background**

The purpose of the proposed action is to continue to provide a reliable supply of electricity to the customers in TVA's southeastern power service region and ensure the stability of TVA's power generation sources. To meet the projected power demands in the southeastern region, TVA plans to implement improvements to increase the generation capacity of the four power generation units at the Raccoon Mountain Pumped Storage facility. TVA has performed detailed analyses of various power generation scenarios in the Hamilton County and Bradley County, Tennessee, areas and a portion of the Catoosa County, Georgia, area that show where and under what circumstances the transmission system would fail to be self-correcting, fail to maintain proper voltage levels, or fail to maintain stability of the power generating plants in the Chattanooga area. Failure of the TVA transmission system to maintain proper voltage levels either from increased power demands or from increases in the generated power load through the system could cause stability problems to occur and damage to the generating facilities in the Chattanooga area. The proposed action would address this need by providing improvements to various parts of the TVA transmission system.

## **Alternatives**

While planning this project, TVA considered various means of providing stability to the TVA transmission system and maintaining an adequate and reliable supply of electricity to TVA's southeastern power service region. In addition to the proposed action (the Preferred Alternative) and the No Action Alternative, TVA considered several other complex alternative plans involving a combination of major transmission line rebuilds and upgrades, substation expansions, and/or new transmission lines and a substation. However, none of these plans solved all the problems of stability, overloads, low voltage, and off-site power supply issues, and all were of equal or greater costs than the alternative that solves all the problems. Also, the complex plans would require more critical transmission components to be out of service during project implementation and would pose an increased risk to transmission reliability. All of the plans would require similar construction activity resulting in similar environmental impacts. None of these more complex alternatives were considered reasonable in light of these factors. The No Action Alternative also is not considered reasonable because it would not meet the stability and overloading issues on the TVA transmission system that would result from the projected power demands of the project area.

The proposed substation location and associated transmission line connections, as well as the upgrades and rebuilds to existing transmission lines and TVA facilities were identified as preferred based on a number of factors including public input, reduction of potential environmental impacts, less property-ownership impacts, and avoidance of cemeteries, schools, and other cultural features. This Preferred Alternative is analyzed in detail in the EA.

## **Impacts Assessment**

The EA concludes that the impacts to terrestrial plant and animal communities would be insignificant. Approximately 30 acres of land for the new transmission line connection rights-of-way and the Bradley 500-kV Substation site is forested and would be converted to nonforested habitats. Habitat for one federally listed candidate plant species occurs along a small section of the 500-kV transmission line connection to the Bradley 500-kV Substation. Additional surveys for this species are planned during the flowering season (late July-August). Should specimens occur in the affected project area, completion of construction on this section would be scheduled during late fall and winter when the plants are dormant. As a result, with the forested wetland clearing limited to 0.27 acre, impacts to this species and its habitat are expected to be insignificant. Although other federally listed species are known from Bradley and Hamilton Counties, Tennessee, and Catoosa County, Georgia, none would be affected by the proposed action. Several state-listed species have been reported from the project area, and potential habitat along the existing transmission lines, Bradley 500-kV Substation site, and associated transmission line connections was identified for some of these species. However, no occurrences of any rare species were observed on or immediately adjacent to the proposed project area during field surveys. No adverse impacts to state-listed terrestrial plant species are anticipated. Individuals of some state-listed terrestrial animal species could experience some disturbance from the proposed actions; however, due to the mobility and wide range of habitat preferences for some individuals and because disturbances would be temporary and relatively isolated for others, no adverse impacts are expected. One state-listed aquatic animal was located within springs and an unnamed stream crossed by the 500-kV transmission line connection right-of-way to the Bradley 500-kV Substation. With the implementation of Best Management Practices (BMPs), Protection of Unique Habitats (Category C), and bank stabilization measures at this location, no adverse impacts to this or any other state-listed aquatic animal species are anticipated.

The proposed transmission line would cross 33 separate wetland areas with a total area of about 25.1 acres. Approximately 24.7 acres of wetlands, comprised of emergent, scrub-shrub, or a combination thereof, are located in the existing transmission line rights-of-way. These wetlands are already periodically cleared by mowing or other methods during routine right-of-way maintenance. Along the new transmission line connection rights-of-way, an approximately 0.11-acre area is scrub-shrub wetlands and an approximately 0.27-acre area is a combination forested and emergent wetlands. The impacts of converting the forested wetland to shrub-scrub were determined to be insignificant because of the small size of the area of impact (less than 0.5 acre).

The project area drains to tributaries of the Conasauga River in the Alabama River Basin and to tributaries of Chickamauga Reservoir and Nickajack Reservoir on the Tennessee River. Aquatic life is supported to varying degrees depending on the type of watercourses in the project area. One sensitive headwater aquatic community is located in a spring-stream complex within the 500-kV transmission line connection right-of-way. A streamside management zone (SMZ) of 150 feet would be implemented in this area. For bank stabilization and a certain degree of canopy cover, stream banks along these watercourses and springs would be planted using native, low-growing, deciduous, and/or scrub-shrub vegetation. To facilitate the establishment of the vegetation and discourage the cattle from using this area, TVA would coordinate with the landowner to fence the width of the SMZ within the right-of-way. Vegetation would be allowed to reach a mature height of 20 feet within the SMZ. With these measures, no significant impacts to this or any other aquatic community is anticipated. The existing transmission lines cross one stream classified as high quality by the state and listed on the Nationwide Rivers Inventory (NRI). A number of streams that are in the project area are on the state 303 (d) list as partially supporting their designated uses due to various reasons. BMPs and other streamside protection measures would be used to help ensure that the impacts of substation and transmission line construction, operation, and maintenance on area streams are minimized. With the implementation of these measures, impacts to streams, aquatic life, and water quality are expected to be insignificant.

Construction of the proposed Bradley 500-kV Substation and the Concord Substation expansion would not involve work within the 100-year floodplain. The proposed 161-kV and 500-kV transmission line rights-of-way into the Bradley 500-kV Substation would cross a small headwater tributary stream. The support structures for these transmission lines would be located outside the limits of the 100-year floodplain. The existing transmission line upgrades and rebuild would cross several floodplain areas. Rebuilding the 4.7-mile section of the East Cleveland-Apison Tap-Catoosa 161-kV Transmission Line could involve the replacement of existing structures or construction of new structures in the 100-year floodplain. Construction of the support structures would not result in any increase in flood hazard, and the proposed action is consistent with the Executive Order on Floodplains. The existing Concord-Sequoyah 161-kV Transmission Line crosses the Chickamauga Reservoir at Tennessee River Mile 483.4. New conductor would be added to the vacant side of the existing structures that would meet the minimum clearing allowance for navigation purposes.

The project is compatible with current land uses, and the proposed action would not materially affect prime farmland. Impacts to recreation activities and transportation would be insignificant. Visual aesthetics would be insignificant with appropriate lighting used to minimize the emitted light and vegetative screening at the Bradley 500-kV Substation. The proposed substation and associated 161-kV and 500-kV transmission line connections are within 3 miles of two managed areas. The existing transmission lines cross one managed area. Additionally, the existing transmission lines and TVA facilities are within 0.5 mile of another NRI-listed stream and within 3 miles of ten additional managed areas and/or ecologically significant sites. Due to the nature

of the work on the existing transmission lines and facilities and/or because the distance to all managed areas or ecologically significant sites, except for the one managed area that is crossed by an existing line, is sufficient, impacts to these areas are anticipated to be minimal and temporary.

It is expected that circuit breakers at the substation could occasionally open to disconnect part of the transmission system during incidents such as excessive current or voltage fluctuations. The resulting noise could startle people nearby; however, because of the infrequent occurrences it would not result in a significant impact

One previously recorded historic property and one historic archaeological site were identified during a survey of the project area. The previously recorded property has been destroyed since its original recordation, and no intact archaeological deposits or features were identified during the investigations of the historic archaeological site. These historic properties were determined ineligible for listing on the National Register of Historic Places.

### **Mitigation**

The siting process TVA used for the proposed substation and associated transmission lines sought to avoid or limit potential environmental impacts where feasible. In addition to this effort, other mitigation measures have been identified during the review of the project. Many of these are standard measures that TVA routinely implements with all of its transmission line projects, such as the use of BMPs and other practices listed in the appendixes of the EA. These include the establishment of SMZs to protect against adverse impacts to water quality and aquatic resources. The following mitigation measures will be implemented to reduce the environmental impacts that could result from the proposed action:

#### Protection of Wetland Habitat

- Additional surveys for the monkey-face orchid will be conducted during the flowering season (late July-August). Should specimens be located, the construction of the section of 500-kV transmission line connection to the Bradley 500-kV Substation that lies within the 150-foot SMZ for the stream/spring complex would be scheduled to occur in late fall or winter. This would be coordinated with the U.S. Fish and Wildlife Service.
- Forested wetland clearing within the right-of-way section of the 500-kV transmission line connection to the Bradley 500-kV Substation would be limited to 0.27 acre.

#### Protection of Aquatic Resources and Water Quality

- With the exception of the unnamed tributary to Taylor Branch spring and stream complex located within the right-of-way of the 500-kV transmission line connection to the Bradley 500-kV Substation, all intermittent and perennial watercourse crossings will be designated as Category A, Standard Stream Protection, as outlined in Muncy (1999).
- The spring-stream complex will be designated as Category C, Protection of Unique Habitats. To provide bank stabilization and a certain degree of canopy cover, stream banks along the tributary watercourses and springs along the 500-kV transmission line connection will be planted using native, low-growing, deciduous, and/or scrub-shrub vegetation. To facilitate the establishment of the vegetation and discourage the cattle from using this area, TVA will coordinate with the landowner to fence the width of the SMZ. Vegetation in the SMZ will be allowed to reach a mature height of 20 feet.

- Watercourses that convey only surface water during storm events (i.e., wet-weather conveyances or ephemeral streams) and that could be affected by the proposed transmission line route will be protected by standard BMPs as identified in Muncy (1999). These BMPs are designed to minimize erosion and subsequent sedimentation in streams.

Visual Protection Measures

- A vegetative screen will be planted with a mixed tree and evergreen shrub species, 10-foot-minimum width, around three sides of the Bradley 500-kV Substation. Shrubs will have a mature height of 10 to 12 feet, and be 4.5 to 5 feet tall when planted, with a maximum spacing of 5 feet. Trees will have a mature height of 30 to 35 feet, or greater, will be a minimum of 9 to 10 feet in height, and will be planted a maximum of 20 feet apart. Screening (trees or shrubs) will not be planted within 20 feet of proposed gates.
- All lights used (including headlights and pole-mounted, equipment-mounted or structure-mounted floodlights) will be fully shielded or will have internal low-glare optics, such that no light is emitted from the fixture at angles above the horizontal. Area lighting and parking lot poles will be no taller than 40 feet, unless they are lighting objects taller than 40 feet. In such cases, pole heights will be minimized.

**Conclusion and Findings**

The Final EA for this proposal concludes that construction and operation of the transmission lines, substation, and TVA facilities will not result in significant adverse impact upon the environment. This conclusion takes into account the implementation of the standard commitments such as the use of BMPs. It is also based on the implementation of the mitigation and avoidance measures mentioned above.

Environmental Policy and Planning’s National Environmental Policy Act (NEPA) Administration staff reviewed the Final EA, agreed with this conclusion, and determined that the preparation of an Environmental Impact Statement is not required.



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

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Date Signed

**Reference**

Muncy, J. A. 1999. A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities (revised). Technical Note TVA/LR/NRM 92/1. Tennessee Valley Authority, Norris, Tennessee. Chris Austin, Chris Brewster, Alicia Lewis, Kenton Smithson, Tina Broyles, Tom Wojtalik, editors.

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