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HAMPTON STATION 500-KV SUBSTATION

DRAFT ENVIRONMENTAL ASSESSMENT

Montgomery County, Tennessee

EAXX-455-00-000-1743073135

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Acronyms, Abbreviations, and Glossary of Terms Used

acre	A unit measure of land area equal to 43,560 square feet
access road	A dirt, gravel, or paved road that is either temporary or permanent, and is used to access the right-of-way and transmission line structures for construction, maintenance, or decommissioning activities
APE	Area of potential effect
BMP	Best management practice or accepted construction practice designed to reduce environmental effects
CAA	Clean Air Act
CBGs	Census block groups
CBMPP	Construction Best Management Practices Plan
CFR	Code of Federal Regulations
circuit	A section of conductors (three conductors per circuit) capable of carrying electricity to various points
conductors	Cables that carry electrical current
CWA	Clean Water Act
danger trees	A tree located outside the right-of-way that could pose a threat of grounding a line if allowed to fall near a transmission line or a structure
dB	decibel
dBA	A-weighted decibel
EA	Environmental Assessment
easement	A legal agreement that gives TVA the right to use property for a purpose such as a right-of-way for constructing and operating a transmission line
EIS	Environmental Impact Statement
EMF	Electromagnetic field
endangered species	A species in danger of extinction throughout all or a significant part of its range
EO	Executive Order
EPA	United States Environmental Protection Agency
ephemeral stream	Watercourses or ditches that only have water flowing after a rain event; also called a wet-weather conveyance
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration

feller-buncher	A piece of heavy equipment that grasps a tree while cutting it, which can then lift the tree and place it in a suitable location for disposal; this equipment is used to prevent trees from falling into sensitive areas, such as a wetland
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GIS	Geographic Information System
groundwater	Water located beneath the ground surface in the soil pore spaces or in the pores and crevices of rock formations
guy	A cable connecting a structure to an anchor that helps support the structure
HUC	Hydrologic Unit Code
HUD	Housing and Urban Development
hydric soil	A soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop conditions of having no free oxygen available in the upper part
hydrophytic vegetation	Aquatic and wetland plants that have developed physiological adaptations allowing a greater tolerance to saturated soil conditions including with limited or absence of oxygen
IDB	Independent Development Board
IPaC	The United States Fish and Wildlife Services' "Information for Planning and Conservation" database tool that allows users to identify managed resources quickly and easily.
I-24	Interstate 24
I-40	Interstate 40
IRP	Integrated Resource Plan
kV	Symbol for kilovolt (1 kV equals 1,000 volts)
Ldn	Day-night sound level
load	That portion of the entire electric power in a network consumed within a given area; also synonymous with "demand" in a given area
LPC	Local power company
mg/L	Milligrams per liter
milligauss	The unit of measurement for the magnetic component of electromagnetic fields (EMF)
MW	Megawatt
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation

NESC	National Electric Safety Code
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NWI	National Wetland Inventory
OHGW	Overhead ground wire
OPGW	Optical ground wire
outage	An interruption of the electric power supply to a user
PEIS	Programmatic Environmental Impact Statement
PI	Point of intersection at which two straight transmission line sections intersect to form an angle
riparian	Related to or located on the banks of a river or stream
ROW	Right-of-way, a corridor containing a transmission line
runoff	That portion of total precipitation that eventually enters a stream or river
SHPO	State Historic Preservation Officer
SMZ	Streamside management zone
SR	State Route
structure	A pole or tower that supports a transmission line
substation	A facility connected to a transmission line used to reduce voltage so that electric power may be delivered to a local power distributor or user
switching station	Essentially a substation without transformers and that operates at a single voltage. Its main purpose is for operational flexibility in connecting circuits or isolating a faulty part of the system in the event of an unexpected outage
surface water	Water collecting on the ground or in a stream, river, lake, or wetland; it is naturally lost through evaporation and seepage into the groundwater
switch	A device used to complete or break an electrical connection
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
TMDL	Total maximum daily load
threatened species	A species likely to become endangered within the foreseeable future

TRAM	Tennessee Rapid Assessment Method developed to rapidly determine the condition of a wetland in the field based solely on hydrogeomorphic classification meant to be a “snapshot” of current condition based on on-site and external influences and variables relative to a reference standard. Information on the condition of the wetland is then used to evaluate a proposed impact justification and assess mitigation needs.
TVA	Tennessee Valley Authority
TVAR	Tennessee Valley Archaeological Research
U. S.	United States
USACE	U. S. Army Corps of Engineers
USCB	U. S. Census Bureau
USDA	U. S. Department of Agriculture
USFS	U. S. Forest Service
USFWS	U. S. Fish and Wildlife Service
USGS	U. S. Geological Survey
wetland	A marsh, swamp, or other area of land where the soil near the surface is saturated or covered with water, especially one that forms a habitat for wildlife
WHO	World Health Organization
WWC	Wet-weather Conveyance. See definition above for ephemeral stream.

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1. Proposed Action – Improve Reliability of Power Supply

The Tennessee Valley Authority (TVA) proposes to supply the load demands requested from two customers, Google and LG Chem, and to provide additional capacity and reliability benefits for the Clarksville, Tennessee and Hopkinsville, Kentucky regions by constructing and operating the new Hampton Station 500-kilovolt (kV) Substation, 161-kV switchyard, and associated transmission lines (Figure 1-1).

TVA would purchase a 107-acre parcel located outside the municipality of Clarksville in Montgomery County, Tennessee for the proposed substation. The proposed substation would utilize approximately 35 acres and would be constructed adjacent to TVA's existing Montgomery 500-kV Substation and LG Chem's new 161-kV substation. Any borrow or fill material needed for the construction of TVA's new substation would be obtained onsite. TVA would also add a 161-kV switchyard in a double-breaker arrangement with two optical ground wire (OPGW)-inclusive 500-kV single circuit transmission line connections by looping the existing Montgomery–Wilson 500-kV Transmission Line into the Hampton Station 500-kV Substation (Figure 1-2). These two 0.1-mile transmission loop lines would be constructed entirely on the proposed substation parcel and would be named the Wilson-Hampton Station and the Montgomery-Hampton Station 500-kV transmission lines. As part of the 107-acre land acquisition, TVA would purchase and remove a residential house. The proposed Hampton Station Substation would include a 500-161-13.2-kV transformer bank, a reactor bank, and all the associated bus work, relays, etc.

TVA would also construct a new 0.5-mile-long OPGW-inclusive double-circuit radial transmission line from the proposed Hampton Station Substation to the new LG Chem 161-kV Substation and would be named the Hampton Station-LG Chem No.1/No.2 161-kV Transmission Line (Figure 1-2). This transmission line would be partially located on the proposed 107-acre substation parcel and partially located on LG Chem's property immediately north of the proposed substation parcel. Approximately 3.3 acres would be acquired for the 200-foot-wide ROW outside of the substation parcel for the 0.5-mile-long line. The ROW would accommodate a second transmission line as needed in the future and is not part of the proposed action in this environmental assessment (EA).

Additionally, TVA would construct two 0.8-mile-long OPGW-inclusive, double-circuit loop lines from the existing Montgomery-Hemlock No. 1 and No. 2 161-kV Transmission Lines into the proposed Hampton Station Substation (Figure 1-2). These lines would be named Montgomery-Hampton Station No.1/No.2 and Hampton Station-Hemlock No.1/No.2 161-kV transmission lines. The two 0.8-mile-long lines would be partially located on the parcel immediately north of the proposed substation parcel and partially on the proposed substation parcel. The 200-foot-wide ROW to be acquired off-site for the two 0.8-mile-long lines would total approximately 14.2 acres.

The scheduled in-service date for the proposed project would be May 2030 or as soon as possible after that date.

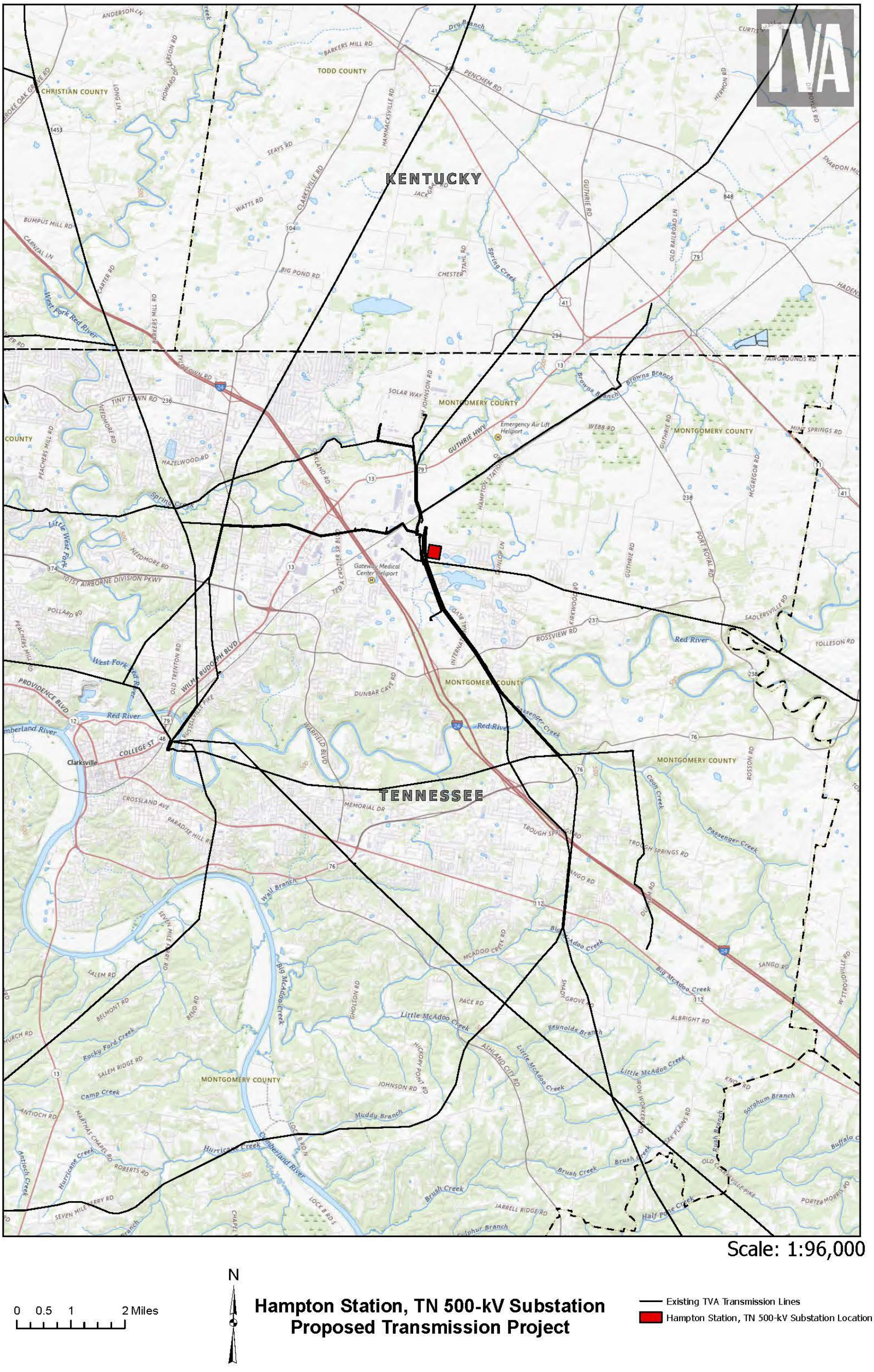

Figure 1-1. Proposed Hampton Station 500-kV Substation Location, Montgomery County, Tennessee

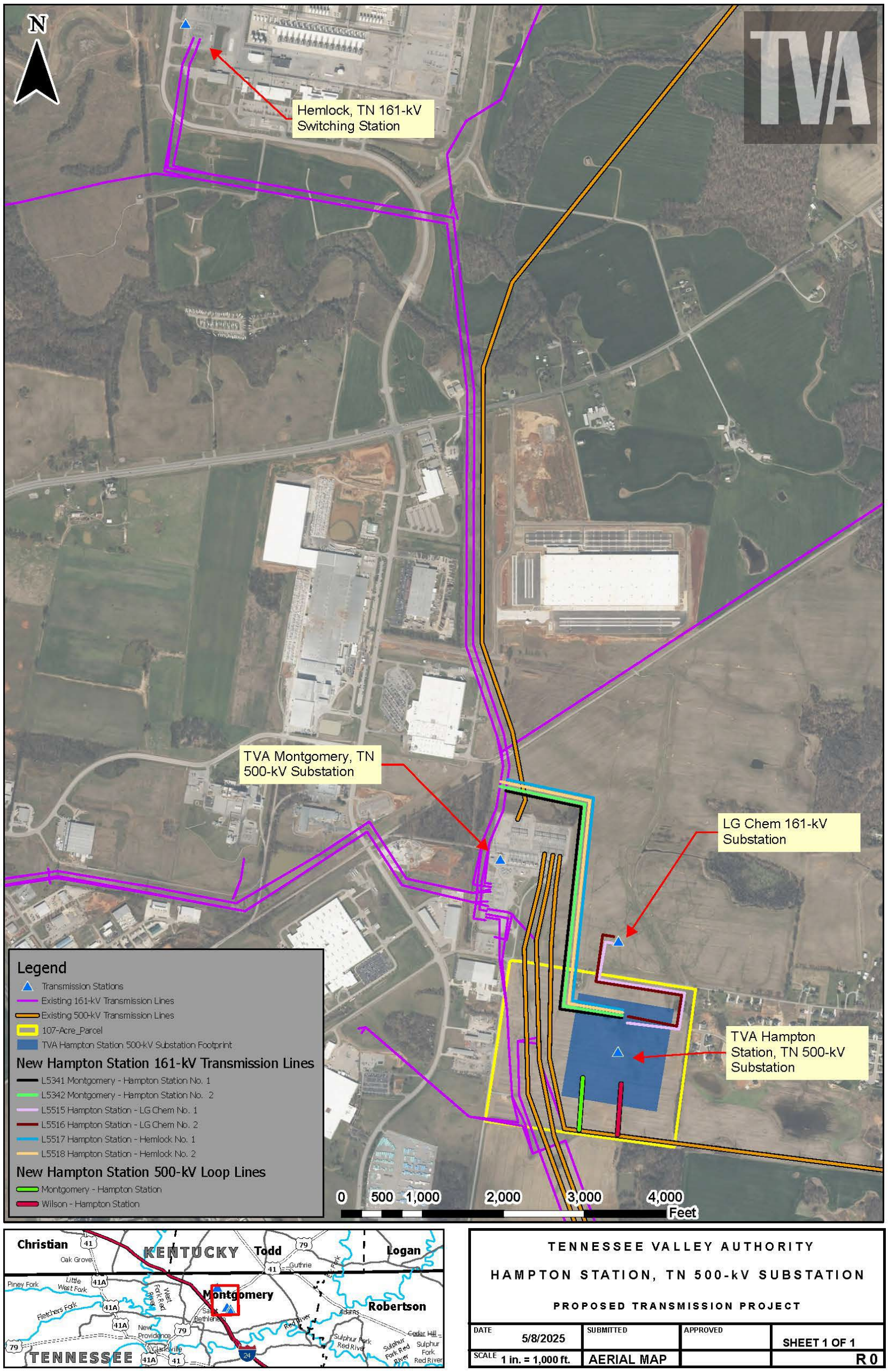

Figure 1-2. Proposed Project Area for TVA's New 500-kV Substation and Transmission Line Connections in Montogomery County, Tennessee

1.2. Need for the Proposed Action

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

TVA's proposed Hampton Station 500-kV Substation and 161-kV switchyard are needed to support the Google load expansion beyond their current 320-megawatt (MW) load and to supply the load for the new LG Chem battery cathode facility, which is currently under construction. Google is currently served from the Hemlock 161-kV Switching Station. The proposed Hampton Station Substation would then instead supply up to 600 MW of capacity for the Google load. Currently, any future 161-kV expansion at the Montgomery 500-kV Substation is limited. The proposed 500-kV substation and 161-kV switchyard located adjacent to the Montgomery and LG Chem substations would provide the load demand as requested by these customers and would provide additional capacity and reliability benefits for the Clarksville and Hopkinsville regions. As such, the proposed project would support TVA's ability to continue to operate its transmission system reliably and within national industry standards.

Transmission benefits from the proposed project would include added capacity with an additional 300 MW for the Clarksville area; outage flexibility; ROW for future expansion; and voltage control in the region.

1.3. Decisions to be Made

The primary decisions before TVA are whether to construct and operate a new 500-kV substation with 161-kV switchyard and OPGW-inclusive transmission lines to supply the load demands requested from two customers, Google and LG Chem, and to provide additional capacity and reliability benefits for the Clarksville and Hopkinsville regions (Figure 1-2). If the proposed substation with switchyard and associated transmission lines are to be built, other secondary decisions are involved. These include the following considerations:

- Timing of the proposed improvements;
- Most suitable location for the proposed substation, switchyard, and transmission lines; and
- Determination of any necessary mitigation and/or monitoring to meet TVA standards and to minimize the potential for damage to environmental resources.

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

1.4. Related Environmental Reviews or Documentation

In 2019, TVA completed the 2019 Integrated Resource Plan (IRP) and the associated environmental impact statement (EIS) (TVA 2019a). These documents provide directions on how TVA can best deliver clean, reliable, and affordable energy in the Tennessee River Valley over the next 20-year planning period, and the associated EIS looks at the natural, cultural, and socioeconomic impacts associated with the IRP. TVA's IRP is based upon a "scenario" planning approach that provides an understanding of how future decisions would

play out in future scenarios. In September 2024, TVA released a new draft IRP for public review and comment, however, at the time this EA was written the final IRP had not yet been published. The 2019 IRP remains valid and guides future generation planning until TVA's subsequent IRP is issued as final with any new or modified recommendations.

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

On September 27, 2024, TVA issued a final EA and Finding of No Significant Impact (FONSI) for its proposal to perform routine vegetation management on about one-third of the transmission system ROWs in each of its Fiscal Years (FY) 2025 and 2026 (TVA 2024). TVA issued final EAs and FONSIs for similar proposals on November 9, 2020 (addressing FY 2021) on October 1, 2021 (addressing FYs 2022 and 2023) and October 19, 2023 (addressing FY 24) (TVA 2020; TVA 2021, TVA 2023). The management of vegetation is needed to ensure the transmission system can continue to provide reliable power and to prevent outages related to incompatible vegetation. Site-specific effects were considered within twelve managed Sectors in areas that had been previously and continuously maintained on a recurring cycle. The EAs tiered from the PEIS which evaluated and analyzed TVA's vegetation management program (TVA 2019b).

TVA will not at this time fully implement this vegetation management program evaluated in the PEIS or the final EA and FONSI described above, as TVA's ROW vegetation management methods are subject to certain restrictions and limitations from an injunction issued by the district court for the Eastern District of Tennessee in *Sherwood v. TVA*, No. 3-12-CV-156. So long as the injunction is in place, TVA will continue to maintain the buffer zones on the edges of its ROW in a manner as described in its 1997 and 2008 Line Maintenance Manuals (TVA 1997; TVA 2008) and any tree work would be limited to trees that would present an immediate hazard to the reliability of the transmission system.

1.5. Scoping Process and Public Involvement

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

- Cherokee Nation
- Coushatta Tribe of Louisiana
- Eastern Band of Cherokee Indians
- Eastern Shawnee Tribe of Oklahoma
- Kialegee Tribal Town
- The Muscogee (Creek) Nation
- The Osage Nation
- Shawnee Tribe
- Thlopthlocco Tribal Town
- United Keetoowah Band of Cherokee Indians in Oklahoma

- Tennessee Department of Environment and Conservation (TDEC)
- United States Fish and Wildlife Service (USFWS)
- United States Army Corps of Engineers (USACE)
- Tennessee State Historic Preservation Office (SHPO)

TVA's preferred location for the proposed 500-kV substation and 161-kV switchyard would be as close to TVA's existing Montgomery 500-kV Substation as feasibly possible. Two large parcels, parcel 1 and parcel 2, were identified near the Montgomery Substation that could meet TVA's needs. Parcel 1 is located adjacent to and immediately north of parcel 2 (Figure 1-3). Preliminary discussions between TVA's Economic Development organization and the Montgomery County Industrial Development Board (IDB) resulted in a recommendation by Montgomery County IDB that TVA consider parcel 2 rather than parcel 1 so that parcel 1 would remain open for industrial development as much as possible. An integral part of the TVA mission is to promote economic development within the TVA service area. The proposed project would preserve parcel 1, which has already achieved TVA's core mission of job creation and capital investment with a company announcement in 2022 during which time, LG Chem announced plans to locate their new battery cathode facility on parcel 1. Therefore, parcel 1 was completely eliminated as being an option for TVA to consider for the proposed 500-kV substation. The approximate 107-acre parcel 2 is owned by a single landowner. As such, TVA then approached this landowner who responded favorably to the sale of the property to TVA.

1.6. Issues to be Addressed

TVA prepared this EA to comply with the National Environmental Policy Act (NEPA). The EA investigates the potential environmental and socioeconomic effects of the proposed construction, operation, and maintenance of the new substation and associated transmission lines as well as the purchase of the substation parcel for satisfying the project's purpose and need or taking no action.

TVA has determined the resources listed below are potentially affected by the alternatives considered. These resources were identified based on internal scoping.

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

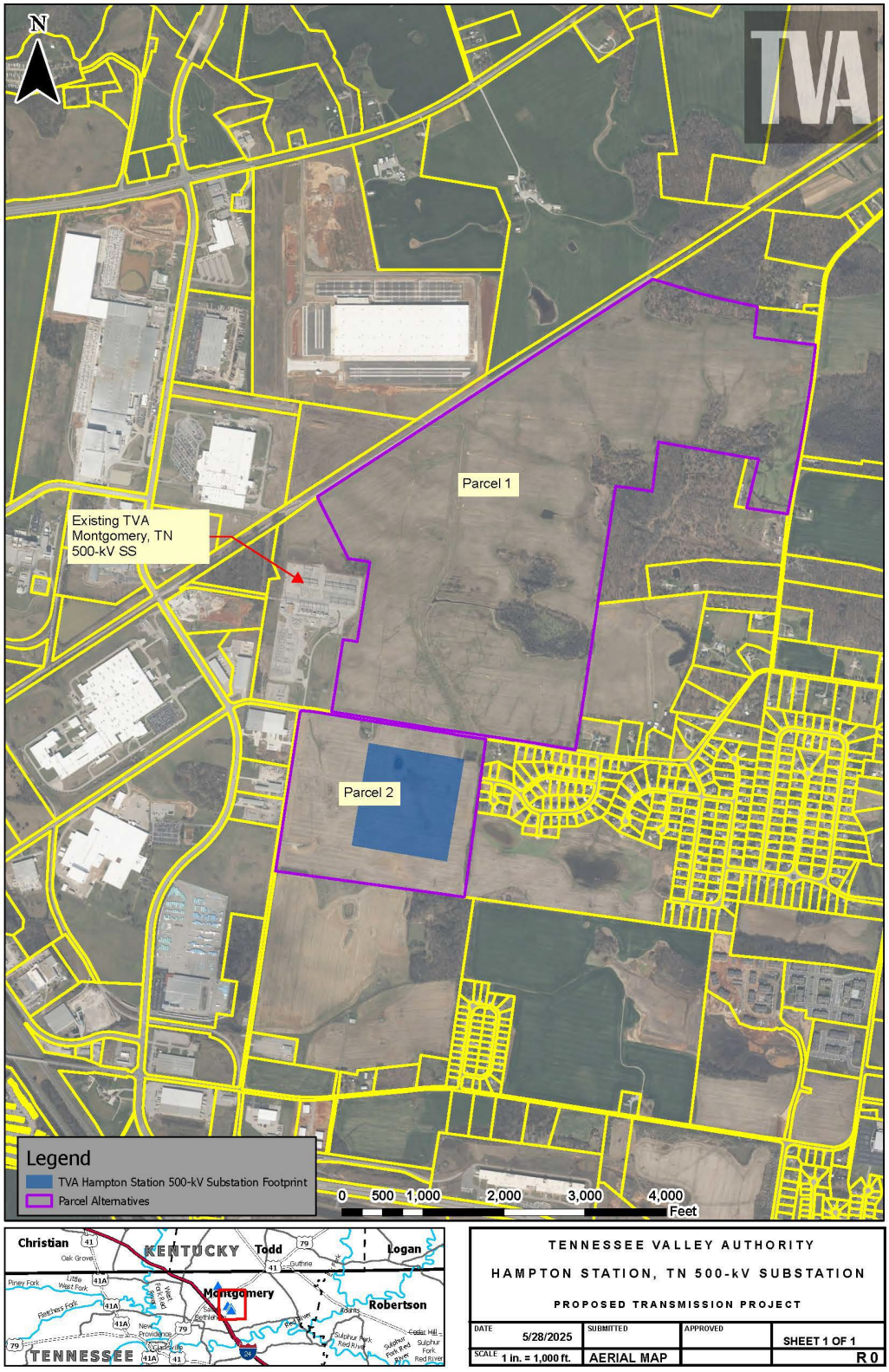

Figure 1-3. Parcel 2 is the Preferred Location for the Proposed Hampton Station 500-kV Substation to Support the Google Load expansion and to Supply the Load for the New LG Chem Battery Cathode Facility

TVA's action would satisfy the requirements of Executive Order (EO) 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), EO 12372 (Intergovernmental Review), EO 13112 (Invasive Species) and EO 13751 (Safeguarding the Nation From the Impacts of Invasive Species) that amends EO 13112, and applicable laws including the Farmland Protection Policy Act, the National Historic Preservation Act, the Endangered Species Act (ESA), the Clean Air Act (CAA), and the Clean Water Act (CWA). Correspondence received from agencies related to this review and coordination is included in Appendix A.

Potential effects related to air quality, global climate change, solid and hazardous waste, and health and safety were considered. Because of the nature of the action, any potential effects to these resources would be minor and insignificant.

1.7. Necessary Permits or Licenses

A permit would be required from the state of Tennessee for the discharge of construction site stormwater associated with the construction of the substation and associated transmission line connections. TVA would prepare the required Storm Water Pollution Prevention Plan (SWPPP) and then coordinate it with the appropriate state and local authorities. A Section 401 Water Quality Certification/Aquatic Resource Alteration Permit (ARAP) may be required from TDEC for actions that involve or affect streams and wetlands. A Section 404 Nationwide Permit would be obtained from the USACE if construction activities would result in the discharge of dredge or fill into waters of the United States (U. S.). A permit would be obtained from Montgomery County for the installation of a septic system at the proposed substation. A permit may also be required for burning trees and other combustible materials removed during construction of the substation and associated transmission line connections.

CHAPTER 2 – ALTERNATIVES INCLUDING THE PROPOSED ACTION

As described in Chapter 1, TVA proposes to build the Hampton Station 500-kV Substation with a 161-kV switchyard and associated transmission line connections to supply the load demands requested from two customers, Google and LG Chem, and to provide additional capacity and reliability benefits for the Clarksville and Hopkinsville regions. A description of the proposed action is provided below in Section 2.1.2. Additional background information about construction, operation, and maintenance of the substation and transmission lines is provided in Section 2.2 and would be applicable regardless of the location of the proposed facilities.

This chapter has six major sections:

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

2.1. Alternatives

Two alternatives (i.e., the No Action Alternative and the Action Alternative) are addressed in further detail in this EA. Under the No Action Alternative, TVA would not implement the proposed action. The Action Alternative involves the construction, operation, and maintenance of the proposed substation and associated transmission line connections and the acquisition of an approximately 107-acre parcel from one property owner.

2.1.1. The No Action Alternative – TVA Does Not Construct the Hampton Station 500-kV Substation, 161-kV Switchyard or the Associated Transmission Lines

Under the No Action Alternative, TVA would not construct the Hampton Station 500-kV Substation with 161-kV switchyard and associated transmission line connections. As such, TVA would not provide the load demand requested by Google and LG Chem. Both customers would continue to operate under current conditions and be restricted in their operations. TVA would also not provide additional capacity and reliability benefits for the Clarksville and Hopkinsville regions. As a result, the TVA power system in the project area would continue to operate under current conditions, increasing the risk for substation and transmission line overloading, loss of service, and occurrence of violations of NERC reliability criteria. TVA's ability to provide a robust, reliable source of power for continued economic, residential and commercial growth in the area would be jeopardized.

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

2.1.2. Action Alternative – Construct the Hampton Station 500-kV Substation, 161-kV Switchyard, and the Associated Transmission Lines

Under the Action Alternative, TVA would construct the Hampton Station 500-kV Substation, 161-kV switchyard, and associated transmission lines (Figure 1-1). The proposed project would include the purchase of an approximate 107-acre site for the new substation. This property is located on the south side of Charles Bell Road near the intersection of Charles Bell Road and Steel Stock Road. A new, 284-foot permanent access road would be constructed on the substation parcel immediately off Charles Bell Road. TVA would prepare approximately 48 acres of the 107-acre parcel for construction of the new facility; however, the substation, and switchyard would occupy approximately 35 acres of the substation parcel (Figure 1-2).

The proposed project area includes the 107-acre substation parcel and two new 200-foot-wide transmission line ROWs for the 0.5- and 0.8-mile-long transmission line connections that would extend north of the substation parcel (Figure 1-2). The proposed substation would be constructed adjacent to TVA's existing Montgomery 500-kV Substation and LG Chem's new 161-kV substation. Any borrow or fill material needed for the construction of the new substation would be obtained on the parcel. If the project were to determine that off-site borrow material is required, TVA would haul the material from a permitted borrow site. Off-site spoil hauling is not anticipated.

To connect the new substation to the transmission system, TVA would add a 161-kV switchyard in double breaker arrangement with two OPGW-inclusive single circuit 500-kV transmission line connections by looping the existing Montgomery–Wilson 500-kV Transmission Line that runs along the southern edge of the proposed substation parcel into the Hampton Station 500-kV Substation. These two 0.1-mile loop lines would be constructed entirely on the proposed substation parcel using self-supporting, galvanized, laced-steel structures or H-frame steel-pole structures and would be named the Wilson-Hampton Station and the Montgomery-Hampton Station 500-kV Transmission Lines (Figure 1-2).

Additionally, TVA would construct a new 0.5-mile-long OPGW-inclusive double-circuit radial transmission line from the proposed Hampton Station Substation to the new LG Chem 161-kV Substation (Figure 1-2). This line would be constructed utilizing two-pole, double-circuit structures and would be named the Hampton Station-LG Chem No.1/No.2 161-kV Transmission Line. This transmission line would be partially located on the proposed 107-acre substation parcel and partially located on LG Chem's property immediately to the north. The portion of the 200-foot-wide ROW to be acquired outside of the substation parcel for the 0.5-mile-long line would total approximately 3.3 acres. The ROW would accommodate a second transmission line as needed in the future and is not part of the proposed action in this EA.

TVA would also construct two 0.8-mile-long OPGW-inclusive, double-circuit loop lines from the existing Montgomery-Hemlock No. 1 and No. 2 161-kV Transmission Lines into the new Hampton Station Substation (Figure 1-2). These lines would be constructed using two-pole, double-circuit structures and would be named Montgomery-Hampton Station No.1/No.2 and Hampton Station-Hemlock No.1/No.2 161-kV transmission lines. The two 0.8-mile-long lines would be partially located on the parcel immediately north of the proposed substation parcel and partially on the proposed substation parcel. The 200-foot-wide ROW to be acquired off-site for the two 0.8-mile-long lines would total approximately 14.2 acres.

As part of the 107-acre land acquisition, TVA would purchase and remove a residential house.

The proposed Hampton Station Substation would include a 500-161-13.2-kV transformer bank, a reactor bank, and all the associated bus work, relays, etc.

Additional information describing the implementation of the proposed Action Alternative is provided below in Sections 2.2 through 2.4.

2.1.3. Alternatives Considered but Eliminated from Further Discussion

The following alternatives were considered not technically and/or economically feasible for the reasons provided below.

2.1.3.1. Split Up the Proposed Hampton Station into Two Separate Sites

TVA considered splitting up the proposed Hampton Station Substation into two separate sites by having a separate 161-kV switching station from the proposed 500-kV substation. Under this alternative, TVA would put a 161-kV switching station on the portion of parcel 1 that LG Chem purchased for their new substation. However, after evaluation, TVA determined that this alternative was technically infeasible based on the property layout and location. For this reason, this option was eliminated from further consideration.

2.1.3.2. Alternative Proposed Locations

TVA evaluated two alternative substation locations during the project planning phase. As mentioned in Section 1.5, the two parcels, parcel 1 and parcel 2, are located near the Montgomery Substation. Parcel 1 is located adjacent to and immediately north of parcel 2 which is described in the Action Alternative (Figure 1-3).

TVA determined Parcel 1 would involve less initial 161-kV transmission line construction. However, it would be more difficult to route 500-kV transmission lines in and out of a proposed substation on parcel 1, because the transmission lines would still need to cross parcel 2. It would also be difficult to cross the existing Montgomery-Wilson 500-kV Transmission Line located to the south. Further, an integral part of the TVA mission is to promote economic development within the TVA service area. Using Parcel 1 for the proposed substation would not meet the project's purpose and need of supporting execution of TVA's mission objectives, including supporting regional economic development opportunities. In 2022, LG Chem announced plans to locate a new battery cathode facility on parcel 1. Therefore, parcel 1 has been eliminated from further consideration.

Although with parcel 2 TVA would still need to purchase property or have an easement on parcel 1 for transmission lines to run to the north, the Montgomery -Wilson 500-kV Transmission Line running along the southern edge of parcel 2 would allow for simpler 500-kV transmission line routing in the future. As such, TVA's Transmission Planning and Economic Development organizations identified parcel 2 as the better plan for the future of TVA load growth based on existing transmission line routes, feasible transmission line connections, and customer needs.

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

2.2.1. Property Acquisition and Clearing

TVA would purchase an approximately 107-acre parcel from one landowner for the proposed substation and switchyard. TVA would remove topsoil and grade approximately 48 acres of the 107-acre substation parcel in accordance with TVA's *Site Clearing and Grading Specifications* (TVA 2025). There would be no tree clearing within the 48 acres. Approximately 35 acres of the 48 acres would be needed for the substation, switchyard, and permanent access road. TVA would utilize an area of the 107-acre parcel as a temporary laydown area for spoil/borrow.

Less than one acre of trees (~ 0.75 acre) would need to be cleared for the proposed transmission line structures in the northeastern corner of the substation parcel. Equipment used during grading and/or clearing would include chain saws, skidders, bulldozers, tractors, and/or low ground-pressure 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 project area to serve as sediment barriers. Implementation of *TVA ROW Clearing Specifications*, *Environmental Quality Protection Specifications for Transmission Line Construction*, *Transmission Construction Guidelines Near Streams* and *Site Clearing and Grading Specifications*, (TVA 2025), and Transmission's best management practice (BMP) guidance (TVA 2022) would provide further guidance for clearing and construction activities.

Following clearing and construction, approximately 13 acres of disturbed areas on the substation parcel, excluding the substation, would be restored to the extent practicable to pre-construction conditions, utilizing appropriate seed mixtures as described in TVA 2022. Erosion controls would remain in place site-wide until the plant communities become fully established.

2.2.1.1. Substation Site Preparation

The site would be leveled through a cut and fill process. The areas of the site that are too high (sloped) must be "cut" down to the desired elevation, and other areas that are too low require "fill" to raise the elevation. The 107-acre substation parcel would include enough area for designated borrow areas to build the substation pad (Figure 2-1). Any additional fill required would be obtained from an approved/permitted borrow area.

Once the substation site has been graded, spoil would be removed in preparation for foundations. Temporary spoil storage would be located onsite in several designated areas. Total disturbance, including grading and spoil material and any necessary detention basins would be approximately 48 acres. Silt fences, site drainage structures, and detention ponds would be installed during construction. The substation yard would be covered with crushed stone and enclosed with chain link fencing. A new permanent gravel access road would be constructed onsite, from Charles Bell Road to the substation, a distance of approximately 284 feet (about 0.05-mile). The unused portion of the approximately 107-acre site would be left undisturbed or would be restored, to the extent possible, to its condition prior to construction.

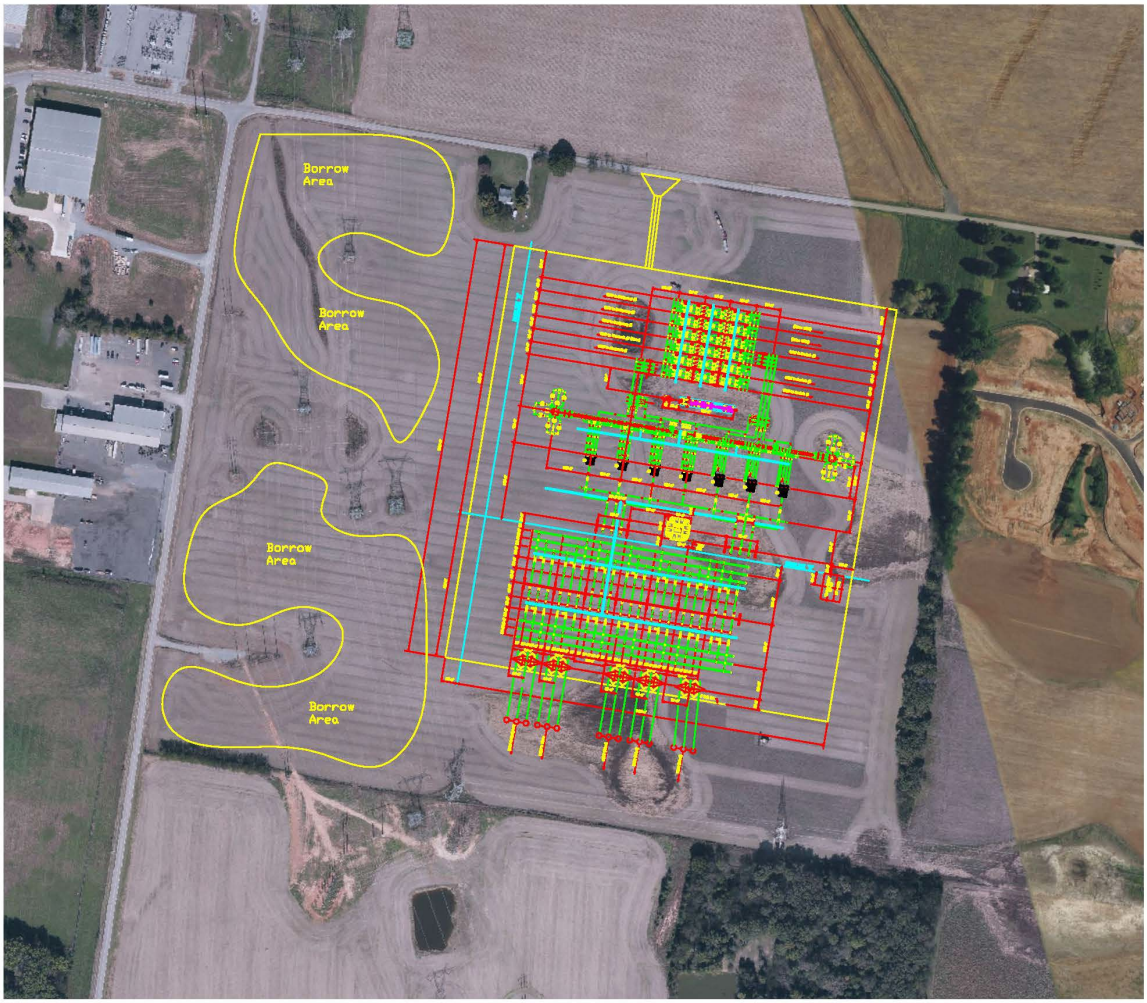

Figure 2-1. Proposed Substation Parcel Showing the Hampton Station 500-kV Substation Footprint and Designated Borrow Areas

Major equipment would include a 500-161-13.2-kV transformer bank, a reactor bank, several circuit breakers, all associated bus work, relays, a supporting steel superstructure, ground wire towers, switch house, and equipment storage building. Oil containment would include a subsurface oil catchment area and associated piping to an oil/water separator to capture any oil from the transformer bank area. The oil/water separator is designed to retain any oil. If the oil should build up, the oil would then be pumped and hauled to an approved waste receiving facility. The circuit breakers installed would utilize SF-6 as the electrical insulator and would contain no oil. The 161-kV switch house would be equipped with water and septic tank drain field. A water line would be installed along the substation access road and connected to the local water supply system. A field line system would be installed to treat the generated sewage.

As described in TVA's *Substation Lighting Guidelines* (TVA 2025), all lights at the substation would be fully shielded or would have internal low-glare optics, such that no light is emitted from the fixtures at angles above the horizontal plane. TVA's *Environmental Quality Protection Specifications for Transmission Substation or Communications Construction* (TVA 2025) would be utilized during the construction of the substation.

2.2.1.2. Right-of-Way Development

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

TVA would acquire the necessary easements for transmission line ROWs that would extend north of the substation parcel (Figure 1-2). These easements would give TVA the right to clear the ROW and to construct, operate, and maintain the transmission line, as well as remove "danger trees" adjacent to the ROW. Danger trees include any trees located beyond the cleared ROW, but that are tall enough to pass within five feet of a conductor or strike a structure should it fall toward the transmission line. The fee simple ownership of the land within the ROW would remain with the landowner, and many activities and land uses could continue to occur on the property. However, the terms of the easement agreement prohibit certain activities, such as construction of buildings and any other activities within the ROW that could interfere with the operation or maintenance of the transmission line or create a hazardous situation.

National Electrical Safety Code standards require minimum clearance distances between conductors and any grounded objects such as trees, buildings, vehicles, roads, and railroads. These minimum clearances vary with voltage. On the ROWs for the transmission line connectors, TVA would ensure that minimum clearances, including an additional safety margin, are maintained under all foreseeable conditions including high winds and icing.

Because of the need to maintain adequate clearance between tall vegetation and transmission line conductors, as well as to provide access for construction equipment, all trees and most shrubs would be removed from the entire width of the ROW. Equipment used during this ROW clearing would include chain saws, skidders, bulldozers, tractors, and/or low ground-pressure feller-bunchers[1]. Marketable timber would be salvaged where feasible; otherwise, woody debris and other vegetation would be piled and burned, chipped, or taken off site. In some instances, vegetation may be windrowed along the edge of the ROW to serve as sediment barriers.

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

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

TVA utilizes standard practices for ROW clearing and construction activities. These guidance and specification documents (listed below) are provided on TVA's transmission system projects web page and are taken into account when considering the effects of the proposed Action Alternative (TVA 2025). TVA transmission projects also utilize BMPs as identified in TVA 2022 to provide guidance for clearing and construction activities.

1. *ROW Clearing Specifications*

2. *Environmental Quality Protection Specifications for Transmission Line Construction*

3. *Transmission Construction Guidelines Near Streams*

4. *Environmental Quality Protection Specifications for Transmission Substation or Communications Construction*

5. *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (hereafter referred to as "TVA 2022")

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

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

2.2.1.3. Access Roads

A new gravel access road, approximately 284 feet long, would be constructed from Charles Bell Road to provide permanent access to TVA's proposed substation. Access to the substation would be located on TVA's substation parcel. Temporary access roads would be constructed to the transmission line work structures for the ROWs that would extend north of the substation parcel. These temporary access roads would be about 20 feet wide and would be surfaced with dirt, mulch or gravel.

Culverts and other drainage devices, fences, and gates would be installed as necessary. Culverts installed in any permanent streams would typically be removed following construction; however, there are no permanent streams within the proposed project area. In wet weather conveyance [WWC]/ephemeral[2] streams the culverts would be left or removed, depending on the wishes of the landowner or any permit conditions that might apply. If desired by the property owner, TVA would restore new temporary access roads to previous conditions. Additional applicable ROW clearing and environmental quality protection specifications are listed in *TVA ROW Clearing Specifications*, *Environmental Quality Protection Specifications for Transmission Line Construction*, and *Transmission Construction Guidelines Near Streams* (TVA 2025).

2.2.1.4. Construction Assembly Areas

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

2.2.1.5. 500-kV Structures and Conductors

The proposed 500-kV transmission loop line connections would be constructed on the substation parcel and would use self-supporting, galvanized, laced-steel structures or H-frame steel-pole structures similar to those shown in Figure 2-2.

The electrical conductors (the cables that carry the electrical current) would consist of three sets of three cables bundled in a triangular configuration, suspended under the structure crossarms by insulators. Two single ground wires would be placed on the two highest points of the structures to provide lightning protection. In some cases, these ground wires may carry fiber optic or other communication circuits. Tower height may vary depending on final grade but would normally range between 90 and 100 feet.

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

Figure 2-2. Examples of 500-kV Transmission Structures

Tower foundations would vary with structure design. The laced-steel structures would be utilized where the line turns at an angle and would require foundations of reinforced concrete. The H-frame steel-pole structures would be directly imbedded into an augured hole and backfilled with concrete. After clearing, construction would generally progress in the following order:

- Excavation of foundation or grillage holes
- Installation of the foundations and grillages
- Assembly, on the ground, of large portions of steel structures
- Placement of the assembled structures on the foundations using cranes
- Hanging of insulators with “pulling blocks” or pulleys attached to allow the new conductors and ground wires to be pulled through
- Pulling the ground wires and conductors into place
- “Sagging” the conductor; that is, adjusting it to the proper tension and height to meet the required clearances
- Clipping the conductor into place on the end of the insulators
- Inspection and testing of the line
- ROW restoration and clean up

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

Following clearing and construction, an appropriate vegetative cover on the ROW would be planted. TVA would utilize appropriate seed mixtures as described in TVA 2022. Erosion controls would remain in place until the plant communities become fully established. Streamside areas would be revegetated as described in the above documents. Failure to

maintain adequate clearance can result in dangerous situations, including ground faults. As such, native vegetation or plants with favorable growth patterns (slow growth and low mature heights) would be maintained within the ROW following construction. All future ROW maintenance would be performed in accordance with the 2019 vegetation management programmatic EIS (TVA 2019b) in accordance with the injunction arising under *Sherwood v. TVA* (Appendix B); until the Sherwood injunction is lifted by a court of competent jurisdiction, TVA will adhere to the terms and conditions of the injunction for all ROW maintenance actions within its scope.

2.2.1.6. 161-kV Structures and Conductors

The proposed 161-kV transmission lines would consist primarily of steel, single-pole and H-frame structures on newly acquired 200-foot-wide ROW easements. Examples of these structure types are shown in Figure 2-3. Structure heights (above ground) would vary according to the terrain but would range between 65.5 to 110.5 feet tall, with an average height of 88 feet above ground.

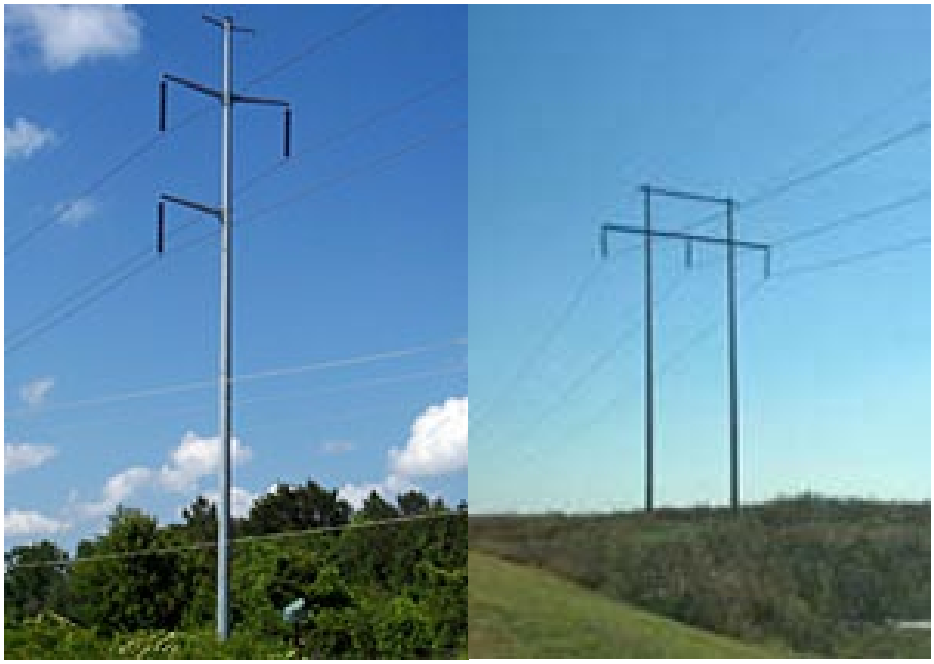

Figure 2-3. Examples of 161-kV Transmission

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

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

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

2.2.1.7. Conductor and Ground Wire Installation

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

2.2.2. Operation and Maintenance

2.2.2.1. Inspection

Periodic inspections of 500-kV and 161-kV transmission lines are performed by helicopter aerial surveillance or by drones after operation begins. Foot patrols or climbing inspections are performed to locate damaged conductors, insulators, or structures, and to discover any abnormal conditions that might hamper the normal operation of the line or adversely affect the surrounding area. During these inspections, the condition of vegetation within the ROW, as well as that immediately adjoining the ROW, is noted. These observations are then used to plan corrective maintenance and routine vegetation management.

2.2.2.2. Vegetation Management

Management of vegetation along the proposed ROWs would be necessary to ensure access to structures and to maintain an adequate distance between transmission line conductors and vegetation. Adequate ground clearance is important to account for construction, design, and survey tolerances (e.g., conductor sagging). TVA uses more conservative distances than NESC requires. TVA uses a minimum ground clearance of 24 feet for a 161-kV transmission line and 30-feet for a 500-kV transmission line at the maximum line operating temperature. Vegetation management along the ROW would consist of two different activities: felling danger trees adjacent to the cleared ROW (as described in Section 2.2.1.2), and vegetation control within the cleared ROW total width. These activities occur on approximately 3-year cycles.

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

TVA will not at this time fully implement this management program evaluated in the PEIS or the final EA and FONSI described above, as TVA's ROW vegetation management methods are subject to certain restrictions and limitations from an injunction issued by the district court for the Eastern District of Tennessee in *Sherwood v. TVA*, No. 3-12-CV-156. So long as the injunction is in place, TVA will continue to maintain the buffer zones on the edges of its ROW in a manner as described in its 1997 and 2008 Line Maintenance Manuals (TVA 1997; TVA 2008) and any tree work would be limited to trees that would present an immediate hazard to the reliability of the transmission system.

Any herbicides used are applied in accordance with applicable state and federal laws and regulations. Only herbicides registered with the U. S. Environmental Protection Agency (EPA) are used. A list of herbicides currently used by TVA in ROW management is presented in Appendix C. This list may change over time as new herbicides are developed or new information on presently approved herbicides becomes available. Additionally, as described in Section 2.2.1.2 Right-of-Way Development, all vegetation management actions subject to the scope of the *Sherwood* injunction will comply with its terms and conditions until a court of competent jurisdiction takes action to lift the injunction.

2.2.2.3. Structure Replacement

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

2.3. Siting Process

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

- Define the study area.
- Determine existing transmission lines to connect to the substation.
- Collect data to minimize potential impacts to social, engineering, and environmental (cultural and natural) features.
- Determine potential substation options.
- Develop associated transmission line routes.
- Gather public input.
- Incorporate public input into the final selection of the preferred substation location and associated transmission lines.

TVA's proposed Hampton Station 500-kV Substation and 161-kV switchyard is needed to support the Google load expansion beyond their current 320-megawatt (MW) load and to supply the load for the new LG Chem battery cathode facility, which is currently under construction on parcel 1. Google is currently served from the Hemlock 161-kV Switching Station (Figure 1-2). The proposed Hampton Station Substation would then instead supply

up to 600 MW of capacity for the Google load. Currently, future 161-kV expansion at the Montgomery 500-kV Substation is limited. The proposed 500-kV substation and 161-kV switchyard adjacent to the Montgomery and LG Chem substations would provide the load demand requested by these customers and also provide additional capacity and reliability benefits for the Clarksville and Hopkinsville regions. As such, the proposed project would support TVA's ability to continue to operate its transmission system reliably and within national industry standards.

The preferred location for a new TVA 500-kV substation and 161-kV switchyard would be as close to TVA's existing Montgomery 500-kV Substation as feasibly possible. Once parcel 2 was identified during the scoping process, TVA began determining whether this parcel would meet our needs for the 500-kV, 161-switchyard, and associated transmission lines (Figure 1-3). TVA would still need to purchase property or have an easement on parcel 1 for transmission lines to run to the north. The Montgomery-Wilson 500-kV Transmission Line running along the southern edge of parcel 2 would allow for more direct and likely more economical 500-kV transmission line routing options in the future. So, TVA determined parcel 2 would work as a feasible alternative for the future of TVA load growth based on existing transmission line routes, feasible transmission line connections, and customer needs. TVA found that the approximately 107-acre parcel (parcel 2) is owned by a single landowner. TVA then approached this landowner who responded favorably to the sale of the property to TVA.

GIS data was limited to a small quadrant in the vicinity of TVA's existing Montgomery 500-kV Substation during the siting of the new Hampton Station 500-kV Substation and 161-kV switchyard. Proximity to the TVA's existing Montgomery-Wilson 500-kV Transmission Line and Montgomery-Hemlock No. 1 and No. 2 161-kV Transmission Lines, and the new LG Chem 161-kV Substation would ultimately reduce the length of loop and radial lines needed to connect the proposed Hampton Station Substation to TVA's existing Montgomery 500-kV Substation and Hemlock 161-kV Substation, and LG Chem's new 161-kV substation.

2.3.1. Definition and Characterization of the Study Area

The study area was determined primarily by the geographic boundaries of TVA's existing power system assets, in addition to the location of TVA's Montgomery 500-kV Substation, outside of the municipality of Clarksville (see Figure 1-2). The proposed project's Study Area encompasses the Clarksville, Tennessee and Hopkinsville, Kentucky regions.

The proposed project area lies within the Elk Fork- Red River (0513020607) 10-digit HUC watershed, in the Western Pennyroyal Karst sub-ecoregion of the Interior Plateau ecoregion. This sub-ecoregion consists of flat irregular plains that commonly contain sinkholes and depressions. The land use of this sub-ecoregion consists primarily of cultivations of livestock and agriculture and commercial/industrial development, with rural residential population centers scattered throughout. Interstate 40 (I-40) runs in a general southeast-northwest direction on the west side of the project area. U. S. Highway 79 (U. S. 79)/State Route (SR) 13 runs northeast of the study area/project area from I-40 to the Kentucky state line. Access to the project area on Charles Bell Road from U. S. 79 is provided from local roadways, International Boulevard and Industrial Park Road.

2.3.2. Data Collection

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

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

Review from aerial photographs, tax maps, and other sources included line length of proposed transmission line connections, amount of existing ROW, road/highway crossings, construction access, amount of ROW needed, forest clearing, wetlands, sensitive stream and/or stream crossings, number of parcel/property tracts, development (both commercial and residential), historical areas and structures, archaeological, and recreational areas. The aerial photography, GIS-based map, and other maps and drawings were supplemented by reconnaissance throughout the study area by TVA.

2.4. Identification of a Preferred Substation Parcel

The preferred location for a new TVA 500-kV substation and 161-kV switchyard would be as close to TVA's existing Montgomery 500-kV Substation as feasibly possible. As such, TVA's preferred location would be the 107- acre parcel (Figure 1-3, parcel 2), adjacent to the Montgomery and LG Chem substations so as to provide the load demand requested by two customers, Google and LG Chem, and provide additional capacity and reliability benefits for the Clarksville and Hopkinsville regions. TVA would acquire approximately 17.5 acres of ROW easements on parcel 1 for the new transmission lines that would extend north of the substation parcel.

2.5. Comparison of Environmental Effects by Alternative

A summary of the anticipated potential effects of implementing the No Action and the Action Alternative is provided in Table 2-1.

Table 2-1. Summary and Comparison of Alternatives by Resource Area

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Groundwater and Geology	No effects to local groundwater quality or quantity are expected.	Impacts to groundwater quality or quantity are anticipated to be minor.
Surface Water	No changes in local surface water quality are anticipated.	Any impacts to surface waters in the project area are expected to be minor, temporary impacts with the proper implementation of erosion and sediment BMPs identified in the SWPPP and TVA requirements as described in TVA 2022.
Aquatic Ecology	Aquatic life in local streams would not be affected.	A 0.08-acre pond would be filled along with alterations to two WWC's; however, impacts to overall aquatic ecology would be insignificant. One pond and its two associated WWC's would be protected through the implementation of SMZ's and BMP's. Impacts to the aquatic ecology of the Elk Fork – Red River watershed would be insignificant.
Vegetation	Local vegetation would not be affected.	No uncommon plant communities are known from the vicinity of the project area. Implementation of the proposed project would have a negligible impact on the terrestrial plant ecology of the region. The use of TVA BMP's, including vegetating with noninvasive species (TVA 2022) would serve to minimize the potential introduction and spread of invasive species in the project area.
Wildlife	Local wildlife would not be affected.	Temporary direct impacts could occur to immobile wildlife during construction activities. Approximately 0.75 acres of forested habitat is proposed for removal between November and December 2026. One pond and one wetland totaling approximately 0.31 acres would be filled. However, the actions are not likely to affect populations of species common to the area, as similar habitat is abundant throughout the surrounding landscape. Populations of migratory birds are not expected to be impacted by the Action Alternative.

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Endangered and Threatened Species	No effects to endangered or threatened species or any designated critical habitats are anticipated.	Approximately 0.75 forested acres proposed for removal is suitable bat foraging habitat. However, similarly suitable foraging habitat is plentiful in the surrounding landscape. Bat foraging habitat also exists over two ponds and within the wetland in the proposed project area. BMPs would be utilized around the pond minimizing impacts to water quality to the extent practicable. The project would fill 0.31 acres of pond and wetland. Given the implementation of standard BMPs around the pond in the northeast corner of the proposed substation parcel, and considering the size of the wetland complex to be filled, and with adherence to relevant conservation measures outlined in the Bat Strategy Project Review form (Appendix F, Table 4), the proposed TVA action is expected to have only minor effects on federally or state-listed species.
Wetlands	No changes in local wetland extent or function are expected.	The proposed project would result in the fill of 0.31 acres of scrub-shrub wetlands within the Elk Fork-Red River watershed of the project area. With implementation of the appropriate permits and mitigation, wetland impacts would be minor on a watershed scale.
Visual Resources	Aesthetic character of the area is expected to remain virtually unchanged.	Minor visual discord above ambient levels would be produced during construction and maintenance activities. There are new residences located just east of the tree line, very near the 107-acre substation parcel boundary. However, the nearest residence would be approximately 250 feet from the eastern edge of the 35-acre substation site within parcel 2 and approximately 150 feet from the 0.5-mile transmission line and 250 feet from the 0.8-mile transmission line. The existing vegetative buffer of tall trees would block unimpeded views of the proposed facilities, which would present a minor, long-term visual effect.

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Noise and Vibration	No noise or vibration impacts from construction or operation would occur because the proposed transmission line and switching station would not be constructed.	Because construction noise would be temporary in nature and limited to daytime hours, noise impacts from construction of the substation, switchyard, and transmission lines would be minor to moderate. Noise increases associated with construction would be temporary, and operational noise emissions of the substation would generally attenuate to levels below recommended residential noise levels and would be negligible to minor.
Land Use and Prime Farmland	No impacts to land use or prime farmland resources would occur.	The proposed project would permanently convert the project area (approximately 124.7 acres) of agricultural land to utility use. The single-family residence on the 107-acre substation parcel would be removed. The surrounding land use includes an existing utility corridor, and the proposed project would be in keeping with that element. Impacts on land use would be minor. The 124.7-acre project area received an impact rating score of 69.5 out of 260. Given the availability of prime farmland in the area and the small amount proposed to be removed in a 1-mile radius (3.5 percent) as well as the relatively lower impact rating, impacts to prime farmland would be minor.
Archaeological and Historic Resources	No adverse effects to archaeological or historic resources are anticipated.	TVA finds that the proposed undertaking would result in no adverse effects on historic properties.
Recreation, Parks, and Managed Areas	No changes in local recreation opportunities, managed areas, natural areas, or ecologically significant sites are expected.	No major impacts are anticipated to recreational opportunities, managed areas, natural areas, or ecologically significant sites.

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Socioeconomics	No change in local demographics, socioeconomic conditions, or community services, and no impacts to minority and low-income populations.	Given the relatively small workforce and that most workers needed would likely be drawn from the existing labor force, impacts to demographics and local employment would be minor. Construction and maintenance activities would also result in minor but beneficial impacts to the local economy. Because the substation and switchyard boundary would be located farther west from the nearby residences (approximately 250 feet), effects to local property values would be minor. The project would not have a notable impact to community facilities and services.
Transportation	No change in traffic levels or other impacts on the transportation network.	Transportation impacts would be localized and minor, lasting through the approximate 45-month construction period. Following construction, ongoing operations and periodic maintenance activities would generate only occasional vehicle trips that would be minimal and would not have an impact on the surrounding traffic network.

2.6. Identification of Mitigation Measures

TVA employs standard practices when constructing, operating, and maintaining substations, transmission lines, structures, and the associated ROW and access roads. These can be found on TVA's Transmission organization's website (TVA 2025). Some of the more specific routine measures which would be applied to reduce the potential for adverse environmental effects during the construction, operation, and maintenance of the proposed transmission line and access roads are as follows:

- TVA would implement erosion and sediment BMPs identified in the SWPPP and TVA requirements as described in Transmission's BMP guidance (TVA 2022), to minimize erosion during construction, operation, and maintenance activities.

- To minimize the introduction and spread of invasive species in the project area and adjacent areas, TVA would follow standard operating procedures consistent with EO 13112 as amended by 13751 (Invasive Species) for revegetating with noninvasive plant species as defined in the BMP guidance (TVA 2022).

- Wetland impacts would be mitigated by TVA's compliance with all USACE and TDEC mitigation requirements in addition to Executive Order 11990. WWCs/ephemeral streams that could be affected by the proposed construction would be protected by implementing standard BMPs as identified in Transmission's BMP guidance (TVA 2022).

- The pond located in the northeast corner of the 107-acre substation parcel would be avoided; however, any potential impacts would be mitigated with the use of Standard Stream Protection (Category A) as defined in TVA 2022.

- Integration of BMPs and the use of relevant conservation measures identified in the Bat Strategy Project Review form (Appendix F, Table 4) would be utilized during construction and maintenance activities to minimize potential impacts to bat foraging habitat.

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

- TVA would follow *TVA ROW Clearing Specifications*, *Environmental Quality Protection Specifications for Transmission Line Construction*, *Transmission Construction Guidelines Near Streams*, and *Site Clearing and Grading Specifications, Environmental Quality Protection Specifications for Transmission Substation or Communications Construction* (TVA 2025), and Transmission's BMP guidance (TVA 2022) during clearing and construction activities.

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

2.7. The Preferred Alternative

The Action Alternative—Construct the Hampton Station 500-kV Substation, 161-kV switchyard, and associated new transmission lines is TVA's preferred alternative for this proposed project. Parcel 1, the 107-acre property located on the south side of Charles Bell Road near the intersection of Charles Bell Road and Steel Stock Road outside the municipality of Clarksville, is TVA's preferred location for the proposed substation. TVA would build, operate, and maintain about 1.3 miles of new transmission lines from the proposed substation to TVA's existing transmission system and the new LG Chem 161-kV Substation. TVA would also install OPGW on the new transmission lines to facilitate communications with the TVA network.

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CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The existing condition of environmental resources that could be affected by the proposed Action Alternative during construction, operation, or maintenance of the proposed substation with switchyard and associated transmission line connections is described in this chapter. The descriptions below of the potentially affected environment are based on field surveys conducted in May, September and November 2024, and July 2025, on published and unpublished reports, and on personal communications with resource experts. This information establishes the baseline conditions against which TVA decision makers and the public can compare the potential effects of implementing the alternatives under consideration.

The analysis of potential effects to endangered and threatened species and their habitats included records of occurrence within a 3-mile radius for most terrestrial animals, a 5-mile radius for plants and northern long-eared bats, and a 10-mile radius for aquatic animals and Indiana bats. Federally listed species found within the county are also included in the analysis. The analysis of potential effects to aquatic resources included the local watershed but was focused on watercourses within or immediately adjacent to the proposed project area: 107-acre substation parcel and ROWs that would extend north of the substation parcel. The Area of Potential Effects (APE) as described in Section 3.9.1 for archaeological and historic resources included areas of potential ground disturbance, including the proposed project area, and all areas in which the project would be visible within a 0.5-mile radius of the proposed transmission lines and substation.

Potential effects related to air quality, global climate change, solid waste, hazardous and nonhazardous wastes, and health and safety were considered. Potential effects on these resources were found to be minimal or absent because of the nature of the action. Based on aerial photography, project maps, Section 3.3 Aquatic Ecology, and the Federal Emergency Management Agency (FEMA) National Flood Hazard Layer, the proposed project would be located outside 100-year floodplains, which would be consistent with EO 11988. The project would have no direct or indirect impacts on the floodplain and its natural and beneficial values. Thus, any further analysis for effects to these resources was not deemed necessary except as discussed in relation to other resource areas.

3.1. Groundwater and Geology

3.1.1. Affected Environment

The project area is composed of an approximate 107-acre substation parcel and two transmission line ROWs totaling approximately 17.5 acres located in the Western Highland Rim physiographic province of central Tennessee. The province is generally characterized by undulating plains and gently rolling hills with many perennial streams and waterfalls that often delineate the Highland Rim from the Central Basin. Carbonate Rock from the Late Paleozoic has been exposed from erosion in the area, and this created a diverse geology with limestone valley floors and sandstone ridges. This area is known for karst topography, which includes sinkholes, caves, and underground drainage systems (GEI Consultants, Inc. 2025).

To evaluate the geotechnical risk related to future karst activity that could negatively affect the performance of the proposed substation, geotechnical and geophysical exploration was performed at the project site (Figure 3-1). In preparation, TVA completed a categorical exclusion checklist 52299 on September 26, 2024 (Appendix D). The exploration program included electrical resistivity using the Wenner 4-in resistivity method (ER), microgravity survey, electrical resistivity tomography (ERT), and soil test borings (Figure 3-2). The ER survey was performed on August 5 and 6, 2024. The microgravity survey was performed from August 6 to 14, 2024. The ERT survey was conducted from January 13 to January 17, 2025. The borings were drilled from September 30 to October 30, 2024.

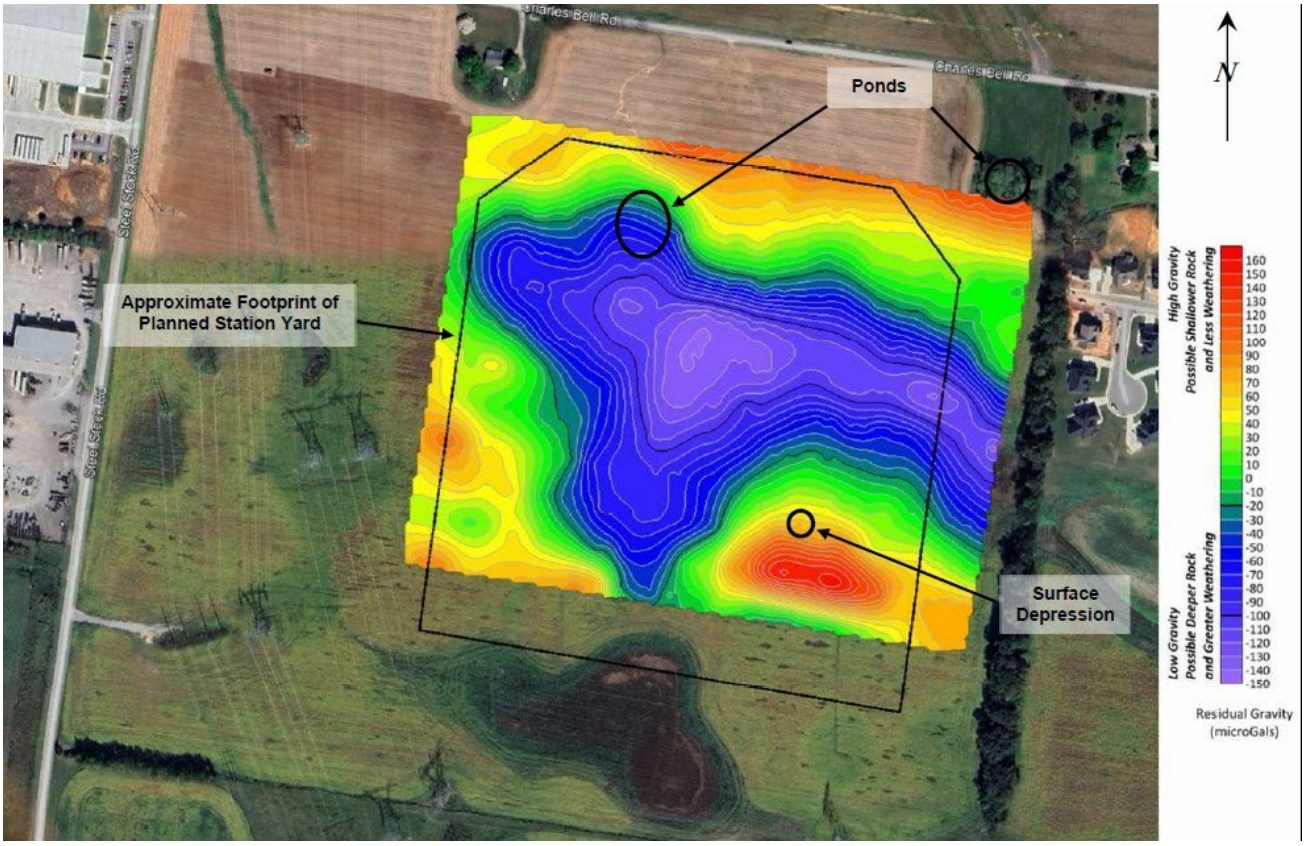

Figure 3-1. Residual Gravity Contour Map with Respect to the Approximate Footprint of the Proposed Substation Site in Montgomery County, Tennessee

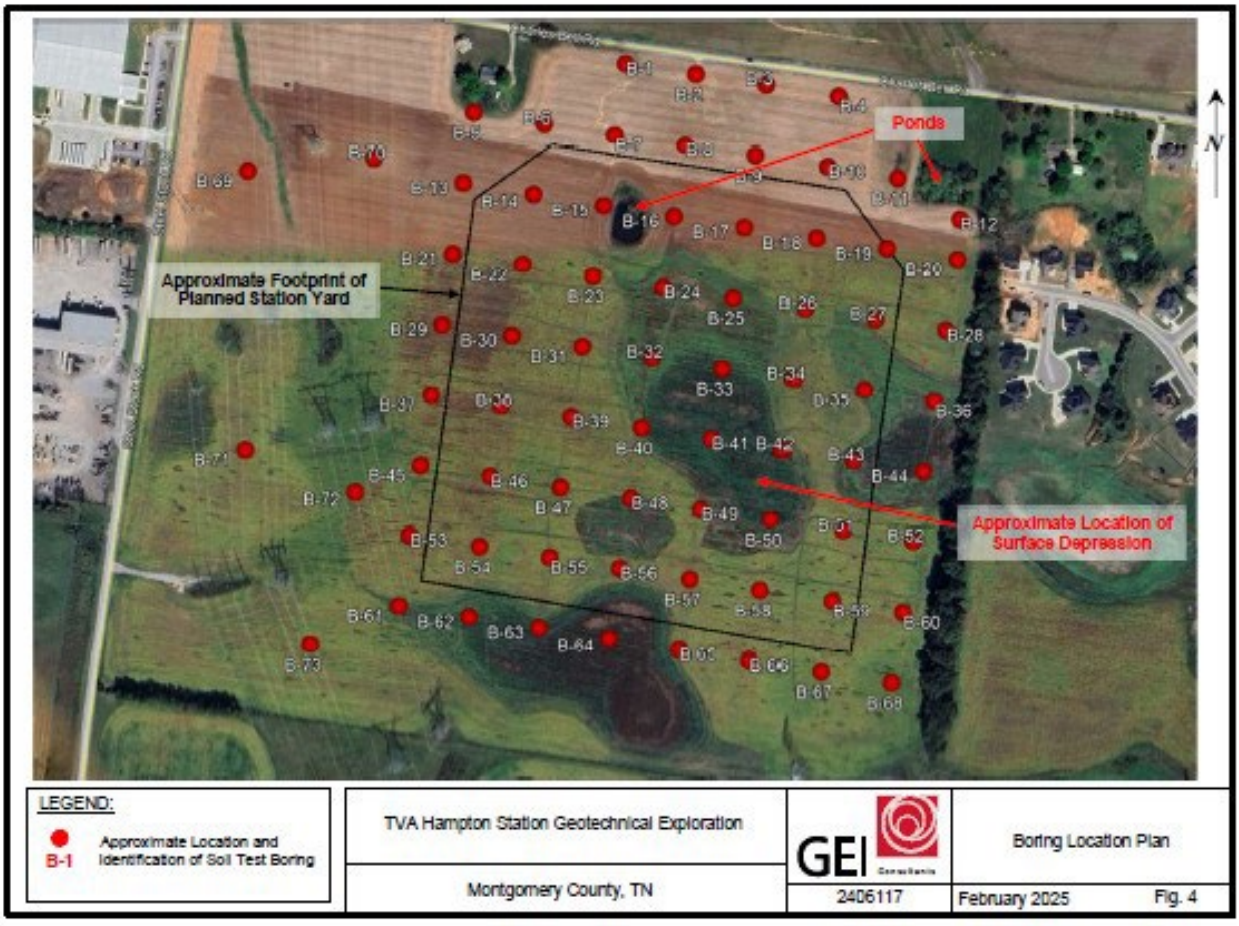

Figure 3-2. Approximate Geotechnical Boring Locations with Respect to the Approximate Footprint of the Proposed Substation Site in Montgomery County, Tennessee

The Knox Aquifer is located throughout two-thirds of Tennessee and is composed of a thick sequence of limestone and dolomite from the Cambrian and Ordovician Ages. The groundwater in the upper portion of the aquifer occurs primarily in thin (1-foot-thick) zones that contain systems of small tubular voids. The Knox Aquifer is thought to be recharged through fractures and faults in the overlaying limestones of the Central Basin aquifer system. It is deep and low yielding but is a dependable source of suitable drinking water. Dissolved solid concentrations of water in the aquifer are more consistent regionally than in the overlaying Central Basin aquifer system. In the upper 300-foot zone, wells near the center of the Central Basin yield water with lower dissolved solids (typically from 500 milligrams per liter [mg/L] to 2,500 mg/L dissolved solids) than do wells near the margin (1,000 to 6,500 mg/L dissolved solids) (USGS 1985).

Public water supply in Montgomery County, in the vicinity of the project area, is provided by several different utility companies. These include Clarksville Water Department, East Montgomery Utility District, and West Robertson Water Authority (TDEC 2024a). Drinking water from these systems is sourced primarily from the Cumberland Reservoir and the Red River (TDEC 2016, 2019a, b). Additionally, Montgomery County residents and privately owned businesses may rely on private wells for water supply (EPA 2024a). The Tennessee Water Well Act of 1963 requires a person to be licensed to drill a water well for domestic use, irrigation, livestock watering, or installing a pump or water treatment device (TDEC 2025a). TDEC also encourages that private water supplies be tested annually.

Within the TDEC Division of Water Resources, the Ground Water Management Program coordinates the development of a Comprehensive State Ground Water Protection Plan with EPA and state agencies with groundwater responsibilities. A major focus of the program is wellhead protection, protecting groundwater sources of public water systems.

The Safe Drinking Water Act of 1974 established the sole source aquifer protection program that regulates certain activities in areas where an aquifer (water-bearing geologic formations) provides at least half of the drinking water consumed in the overlying area. No sole source aquifers exist in Tennessee (EPA 2024b). However, the TDEC Division of Water Resources ensures safe drinking water to citizens of Tennessee by enforcing requirements of the Federal and State Safe Drinking Water Acts (TDEC 2025b).

3.1.2. Environmental Consequences

3.1.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the substation, switchyard or transmission lines. Therefore, no impacts to groundwater or geologic resources would occur as a result of TVA actions associated with the project.

3.1.2.2. Alternative B – Action Alternative

Considering the nature of the proposed project and the obtained subsurface data, the site was determined as suitable for the proposed construction with implementation of recommendations by GEI Consultants, Inc. (GEI Consultants, Inc. 2025). Proposed construction activities would entail localized ground disturbance and shallow excavation. The depth of excavation would be approximately 10 percent of the pole structure height plus an additional 2 feet. Because proposed structures would not exceed 115 feet in height, the maximum excavation depth would be approximately 13 feet below ground surface. These construction activities would include approximately 35 acres of the 107-acre substation parcel, the transmission line connections, and a small portion of the 0.5-mile-long, 3.3-acre and 0.8-mile-long, 14.2-acre transmission lines and 200-foot-wide ROWs.

Reasonably foreseeable effects include potential releases of contaminants into groundwater and encountering groundwater during excavation, which would require proper disposal. Impacts to shallow groundwater could occur due to releases of contaminants such as petroleum fuels, lubricants, and hydraulic fluids associated with the operation and maintenance of construction equipment. However, the use of appropriate BMPs would minimize and avoid the potential for such releases. These BMPs include the proper maintenance of vehicles, restriction of maintenance and fueling activities to appropriate off-site areas, measures to avoid spills, and immediate management of incidental and accidental releases in accordance with standard practice and regulatory requirements. Therefore, effects from releases of pollutants during construction would be negligible.

If groundwater is encountered during any construction or maintenance activities, dewatering processes would be used to control groundwater infiltration into the excavation site and all state and federal requirements relating to groundwater protection would be followed. BMPs as described in TVA 2022 would be used to control sediment infiltration from stormwater runoff to minimize impacts on groundwater. The proposed construction activities and below ground excavation would be localized and limited to the construction phase of the project; therefore, any impacts to groundwater would be minor.

3.2. Surface Water

3.2.1. Affected Environment

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

The proposed project is located within the Cumberland River basin and drains to an unnamed tributary to Red River in the Red River watershed (TDEC 2021a). The Red River is a pastoral float stream with numerous sinkholes and caves, as well as heavily wooded bluffs with limestone outcroppings (TDEC 2007). Field surveys in September 2024 and July 2025 documented six aquatic features (four WWCs/ephemeral streams and two ponds) on the 107-acre substation parcel (Figure 3-2; Figure 3-3). No intermittent or perennial streams were present. No watercourses were identified along the proposed transmission line ROWs that would extend north of the substation parcel. Hydrologic determinations were performed according to the TDEC Division of Water Resources (TDEC-DWR) Guidance for Making Hydrologic Determinations and is described in Section 3.3 Aquatic Ecology [Rule 0400-4-3-.04(20)]" (TDEC 2020).

Precipitation in Montgomery County and vicinity averages about 51 inches per year. The wettest month is May, with approximately 5.7 inches of precipitation, and the driest month is August, with approximately 3.0 inches of precipitation. The annual air temperature ranges from a monthly average low of 48 degrees Fahrenheit to a monthly average high of 70 degrees Fahrenheit (U. S. Climate Data 2025). Stream flow varies with rainfall and averages about 20.1 inches of runoff per year (USGS 2023).

In Tennessee, TDEC designates uses specified in water quality standards for surface waters. State waters are classified into domestic water supply, industrial water supply, fish and aquatic life, trout stream, naturally reproducing trout stream, recreation, livestock watering and wildlife, irrigation, and navigation (TDEC 2024b). All miscellaneous and unnamed tributaries, unless otherwise specified, will remain "Not Assessed by the State" for designated uses (TDEC 2021a). Other streams nearby include Spring Creek, about 1.5 miles north; Red River, about 2.6 miles south; and Dunbar Cave Creek, approximately 2.9 miles southwest. Table 3-1 provides a listing of streams in the general project vicinity with their designated use classification. Except for the unnamed tributary to Red River, all streams in the project vicinity are classified by the State for Fish and Aquatic Life, Recreation, Livestock Watering and Wildlife, and Irrigation (see Table 3-1).

Figure 3-3. Proposed Substation Parcel Showing Four Wet-Weather Conveyances/Ephemeral Streams, Two Ponds, and a Fringe Wetland in Montgomery County, Tennessee

Table 3-1. Uses for Streams in the Vicinity of the Hampton Station 500-kV Substation

Stream	Use Classification								
	DOM	IWS	FAL	REC	LWW	IRR	NAV	TS	NRTS
Red River			X	X	X	X			
Unnamed Trib. to Red River			--	--	--	--			
Spring Creek			X	X	X	X			
Dunbar Cave Creek			X	X	X	X			

Source: TDEC 2024b
Key: DOM = Domestic Water Supply, ISW = Industrial Water Supply, FAL = Fish and Aquatic Life, TS = Trout Stream, NRTS = Naturally Reproducing Trout Stream, REC = Recreation, LWW = Livestock Watering and Wildlife, and IRR = Irrigation

Section 303(d) of the CWA requires all states to submit their list of impaired and threatened waters, which are waters where all required pollution controls are not sufficient to attain or maintain water quality standards. States are also required to establish total maximum daily loads based on the severity of the pollution and sensitivity of the water uses. The list of impaired and threatened water is submitted to the EPA and is developed into a "303(d) list." The miscellaneous tributary to Red River is not listed on the 2024 303(d) list as impaired. Spring Creek, Dunbar Cave Creek, and Red River are listed on Tennessee's 2024 303(d) list as impaired due to total phosphorus, *E. Coli*, sedimentation or siltation, physical substrate habitat alterations from municipal point source discharges, and alteration in stream-side or littoral vegetative covers (TDEC 2024c) (Table 3-2).

Table 3-2. TDEC 303(d) Listed Streams in the Vicinity of the Hampton Station 500-kV Substation

Stream	303(d) Impaired Stream		
	Use Support	Cause	Source
Red River	Impaired	E. Coli, nutrient load, sedimentation/siltation, and other anthropogenic substrate alterations.	Sanitary sewer overflows, site clearance, crop production (non-irrigated) municipal point source discharge, and grazing in riparian or shoreline zones.
Spring Creek	Impaired	E. Coli, nutrient load, sedimentation/siltation, and alteration in stream-side or littoral vegetative covers.	Sanitary sewer overflows, municipal point source discharges, grazing in riparian or shoreline areas, Crop Production (non-irrigated), site clearance (development or redevelopment), and source unknown.
Dunbar Cave Creek	Impaired	Physical substrate habitat alterations and sedimentation/siltation.	Municipal point source discharge.

Source: TDEC 2024c

3.2.2. Environmental Consequences

3.2.2.1. Alternative A - No Action

Under the No Action Alternative, TVA would not construct the substation, switchyard and transmission lines; therefore, there would be no impacts on surface waters.

3.2.2.2. Alternative B - Action Alternative

3.2.2.2.1. Surface Runoff

Reasonably foreseeable effects from construction activities associated with the project would involve ground disturbance that could result in potential increases in erosion and sediment releases, which may temporarily affect local surface water via stormwater runoff. Soil erosion and sedimentation can contaminate and block small streams and threaten aquatic life. Accidental spills from petroleum leaks and construction equipment and discharges from equipment washing and dust control measures could also release contaminants via stormwater runoff, further degrading surrounding waterways.

TVA proposes to avoid the pond, P001 (Figures 3-2 and 3-3), located in the northeast portion of the proposed 107-acre substation parcel. However, any potential impact to this pond would be avoided and minimized using Standard Stream Protection (Category A) as defined in TVA 2022. Pond P002 (0.08 acre) is located in the north central portion of the proposed substation parcel (Figures 3-2 and 3-3) and would be filled for the construction of the substation. Two of the WWCs would likely be impacted due to the borrow material that would be needed for the construction of the substation (Figures 2-1 and 3-3). Appropriate BMPs would be followed to ensure the project would minimize potential effects and possible introduction of pollutants into nearby surface waters as a result of the grading plan and substation construction. A General Permit for Storm Water Discharges Associated with Construction Activities (TDEC 2021b) would be required and obtained for this project. In addition, a project-specific SWPPP (TDEC 2024d) would be prepared and implemented throughout the duration of construction activities in accordance with general permit requirements to minimize potential impacts and possible introduction of pollutants into surface waters.

Equipment washing and dust control discharges would be handled in accordance with BMPs described in the *Tennessee Erosion and Sediment Control Manual* (TDEC 2012). TVA routinely includes precautions in the design, construction, and maintenance of its substation and transmission line projects to minimize potential impacts to sensitive resources. BMPs include washing equipment in specified areas where water runoff is mitigated to minimize pollution entering surface waters (TVA 2022). Implementation of BMPs would minimize the potential effects to surface waters during construction. Therefore, construction of the project would result in minor impacts to surface water.

The proposed project would include vegetation and ground cover clearing for placement of impervious surfaces for buildings and associated infrastructure, which can impede rainfall percolation through the soil. Conversion of pervious areas to impervious surface can result in increases in stormwater runoff and pollutants into storm drains, ditches, and streams. These permanent impervious facilities may alter existing stormwater flows on-site. Post-construction stormwater flows would be properly treated by implementing proper stormwater BMPs as described in (TVA 2022). Therefore, impacts to surface waters from the operation of the project would be minor.

With an increased on-site workforce during the construction phase, making arrangements to provide additional restroom facilities would be necessary. Temporary toilet facilities would be provided by a licensed vendor, and sanitary wastewater would be disposed of at an approved facility.

3.2.2.2.2. Substation and Transmission Line Maintenance

Improper use of herbicides near streams to maintain and control vegetation within the substation/switchyard and along transmission line ROWs may increase runoff rates to streams, which can impact resident aquatic biota. Therefore, any herbicide/pesticide use associated with construction or maintenance activities in Tennessee would comply with the TDEC General Permit for Application of Pesticides, which requires a pesticide discharge management plan. In areas requiring chemical treatment, only EPA-registered and TVA-approved herbicides would be used in accordance with label directions designed in part to restrict applications near receiving waters and to prevent unacceptable aquatic impacts and maintenance activities during operation. TVA would employ manual and low-impact methods wherever possible. Maintenance of vegetation would also be consistent with TVA's PEIS (TVA 2019b) and TVA 2022. Therefore, the effects to surface water from transmission line maintenance would be minor.

3.3. Aquatic Ecology

3.3.1. Affected Environment

The proposed project area lies within the Elk Fork- Red River (0513020607) 10-digit HUC watershed, in the Western Pennyroyal Karst sub-ecoregion of the Interior Plateau ecoregion. This sub-ecoregion consists of flat irregular plains that commonly contain sinkholes and depressions. The land use of this sub-ecoregion consists primarily of cultivations of livestock and agriculture. This sub-ecoregion historically contained the largest natural grasslands in Tennessee and contains fewer perennial streams than surrounding ecotypes (Griffith et al. 2009). September 2024 and July 2025 field surveys documented six aquatic features in the proposed project area (four WWCs/ephemeral streams and two ponds) (Figures 3-2 and 3-3). Additional information regarding watercourses located in the vicinity of the project area can be found in Section 3.2 Surface Water. No intermittent or perennial streams were present in the project area. Aquatic features were only present on the 107-acre substation parcel; no watercourses were identified on the portions of the proposed transmission line ROWs that would extend north of the substation parcel.

TVA assigns appropriate SMZs and BMPs based on field observations and other considerations (i.e., State 303(d) listing and presence of endangered or threatened aquatic species). Appropriate application of SMZs and BMPs would minimize the potential for impacts to water quality and in-stream habitat degradation which could limit impacts on aquatic organisms. TVA would adhere to state and federal permit requirements and mitigate any adverse modifications.

Hydrological determinations were performed according to TDEC-DWR Guidance for Making Hydrologic Determinations to determine jurisdictional status of linear water features located within the project area. WWCs are "man-made or natural watercourses, including natural watercourses that have been modified by channelization: (a) that flow only in direct response to precipitation runoff in their immediate locality; (b) whose channels are at all times above the ground water table; (c) that are not suitable for drinking water supplies; (d) and in which hydrological and biological analysis indicate that, under normal weather

conditions, due to naturally occurring ephemeral or low flow there is not sufficient water to support fish, or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two months [Rule 1200—3.04(25)].

3.3.2. Environmental Consequences

3.3.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the new substation, switchyard, or transmission lines. No impacts would occur to aquatic ecology as a result of TVA actions. Surrounding developments of industrial and residential infrastructure are anticipated to continue over time and would be expected to indirectly affect aquatic ecology in the surrounding area.

3.3.2.2. Alternative B – Action Alternative

As part of the Action Alternative, the WWC/ephemerals streams, WWC-E001 and WWC-E002 (Figure 3-3), in the proposed borrow areas would likely be impacted (Figure 2-1) to obtain fill material for the construction of the substation. Pond P002, located in the north central portion of the proposed substation parcel (Figures 3-2 and 3-3), would be filled to construct the substation. Applicable permits would be obtained prior to any construction for any surface water alterations located within the proposed project area. The terms and conditions of these permits would be followed including any required mitigation from the proposed activities. The other pond, P001, and its associated WWC's/ephemeral streams, E003 and E004, would be avoided; however, any potential impact would be mitigated with the use of Standard Stream Protection (Category A) and standard BMPs as defined in TVA 2022. This standard (basic) level of protection for streams and the habitats around them is aimed at minimizing the amount and length of disturbance to the water bodies without causing adverse impacts on the construction work.

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

Because appropriate BMPs and stream protection measures would be implemented during construction, operations and maintenance activities, any impacts to aquatic ecology would be temporary and insignificant as a result of implementing the proposed Action Alternative.

3.4. Vegetation

3.4.1. Affected Environment

Aerial photos, topographic maps, and site visits indicated the project area consists primarily of heavily disturbed agricultural fields. Rotational crop fields containing corn and soybeans inhabit most land on the substation parcel as well as the transmission line corridor. Small areas of secondary forest remain along an old fence line within the proposed project area. The forested area is indicative of low-quality habitat with a mixture of invasive and early successional native species. A small, disturbed wetland is present in a crop field area that contains black willow, dock, and other common wetland species. The proposed project area does not contain habitat capable of supporting rare species.

EO 13112 directed TVA and other federal agencies to prevent the introduction of invasive species (both plants and animals), control their populations, restore invaded ecosystems

and take other related actions. EO 13751 amends EO 13112 and directs actions by federal agencies to continue coordinated federal prevention and control efforts related to invasive species. This order incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into federal efforts to address invasive species. Some invasive plants have been introduced accidentally, but most were brought here as ornamentals or for livestock forage. Because these robust plants arrived without their natural predators (insects and diseases) their populations spread quickly across the landscape displacing native species and degrading ecological communities and ecosystem processes (Miller 2010). EO 13112 serves to prevent the introduction of invasive species and provides for their control to minimize the economic, ecological, and human health impacts that those species potentially cause. In this context, invasive species are nonnative species that invade natural areas, displace native species, and degrade ecological communities or ecosystem processes (Miller 2010). Much of the project area is currently dominated by invasive species, which reflects the frequency and magnitude of disturbance present on site. The proposed project activities would not contribute to the spread of invasive species.

3.4.2. Environmental Consequences

3.4.2.1. Alternative A – No Action

Under the No Action Alternative, the project area would remain in its current condition and no project-related work would occur. The project area would continue to be dominated by non-native and early successional species indicative of disturbed habitats. Any changes to vegetation within the project area would be the result of other natural or anthropogenic factors and would not be the result of the proposed project. Therefore, there would be no impact to terrestrial plant ecology under the No Action Alternative.

3.4.2.2. Alternative B – Action Alternative

Adoption of the Action Alternative would not negatively impact vegetation on any appreciable scale. Converting cropland for construction of the proposed substation would be long term in duration, but insignificant. Construction of the proposed transmission lines would have negligible impacts to vegetation due to their proposed locations in agricultural fields. Less than 1 acre of forest would be removed for the proposed project. The small areas of forested and herbaceous communities found in the project area do not support native plant communities with conservation value. The implementation of the proposed project would have a negligible impact on the terrestrial plant ecology of the region.

The project area has a substantial component of invasive terrestrial plants and adoption of the Action Alternative would not significantly affect the extent or abundance of these species at the county, regional, or state level. The use of TVA BMP's, including vegetating with noninvasive species (TVA 2022) would serve to minimize the potential introduction and spread of invasive species in the project area.

3.5. Wildlife

3.5.1. Affected Environment

Field surveys were conducted in November 2024 for terrestrial animal species and their habitats. The project area is primarily open agricultural field with some areas of early-successional vegetative growth. Forested areas in the proposed project area are primarily deciduous. Two small ponds and one 0.31-acre wetland occur in the proposed project area (see Figure 3-3; Section 3.3 Aquatic Ecology, and Section 3.7 Wetlands for more details). Overall, wildlife communities present in the project area are common to the region.

Deciduous forests provide habitat for an array of terrestrial animal species. Birds commonly observed in this habitat include blue-gray gnatcatcher, Carolina wren, and tufted titmouse. These areas also provide foraging and roosting habitat for several species of bat, particularly in areas where the forest understory is partially open. Common bat species likely found within this habitat include big brown bat and eastern red bat. Eastern chipmunk, eastern gray squirrel, raccoon, and white-tailed deer are other common forest mammals in this region (Whitaker 1996). Eastern fence lizard and gray rat snake are reptiles that can be found in forests in this region (Powell et al. 2016).

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

Developed areas were present at road crossings and residential areas within the proposed project area and are home to a number of common species. American crow, blue jay, mourning dove, northern cardinal, and red-bellied woodpecker are birds observed along road edges, farms, and residential yards. Mammals observed or commonly found in this community type include eastern gray squirrel, eastern mole, striped skunk, and Virginia opossum (Whitaker 1996). Roadside ditches provide potential habitat for amphibians such as American toad and spring peeper. Reptiles potentially present include common five-lined skink, common gartersnake, and Dekay's brownsnake (Powell et al. 2016).

Two ponds and one wetland occur within the project area. Turtles, likely red-eared sliders, were observed basking during the field survey. Muskrat and southern short-tailed shrew are common mammals in emergent wetland and aquatic communities (Whitaker 1996). Common snapping turtle, common watersnake, pond slider, and rough green snake are common reptiles likely present within this habitat (Powell et al. 2016). Amphibians likely found in this area include dusky salamander, eastern newt, Fowler's toad, green treefrog, and southern leopard frog (Powell et al. 2016).

Review of the TVA Regional Natural Heritage database in November 2024 indicated that nineteen caves have been recorded within three miles, the nearest occurring approximately 2.54 miles from the proposed actions. No other unique or important terrestrial habitats were identified within the project area during the field survey. In addition, no aggregations of migratory birds or wading bird colonies have been documented within three miles of the project area, and none were observed during the November 2024 field surveys.

3.5.1.1. Migratory Birds

No bald eagle or heron nests have been previously recorded within three miles of the proposed substation and associated transmission line ROWs, and none were observed during field surveys. One osprey nest was previously recorded within the project boundary on a transmission structure; however, the nest was no longer present during the 2024 field review. Review of the USFWS's Information for Planning and Consultation (IPaC) website in March 2025 resulted in 15 migratory bird species of conservation concern (bald eagle, black-billed cuckoo, bobolink, cerulean warbler, chimney swift, field sparrow, grasshopper sparrow, Kentucky warbler, lesser yellowlegs, prairie warbler, prothonotary warbler, red-headed woodpecker, rusty blackbird, semipalmated sandpiper, and wood thrush) identified as having the potential to occur in the project area. See Section 3.6 Endangered and Threatened Species for a full bald eagle impact analysis. For a description of habitat preferences for the remaining 14 migratory bird species, refer to Appendix E.

3.5.2. Environmental Consequences

3.5.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not implement the proposed project. Tree clearing and earth moving would not occur. Trees, soil, and vegetation would remain in their current state and terrestrial animals and their habitats would not be affected.

3.5.2.2. Alternative B – Action Alternative

Under the proposed Action Alternative, wildlife currently using the proposed project area, primarily common, habituated species, would be displaced by habitat removal or alteration. Construction-associated disturbances and habitat removal would disperse mobile wildlife into surrounding similarly suitable habitat. Less mobile individuals may be directly impacted by construction, particularly if clearing activities take place during breeding/nesting/hibernating seasons. In these areas, impacts to wildlife habitat would be limited to locations where structure installation and tree removal for ROW and substation establishment would cause ground disturbance. Approximately 0.75 acres of forested habitat is proposed for removal between November and December 2026. Species that rely on forested habitat may be required to find new food and shelter sources and reestablish territories. However, the actions are not likely to affect populations of species common to the area, as similarly forested habitat exists in the surrounding landscape.

Some of the migratory birds of conservation concern identified by the USFWS could be impacted by the proposed actions. Suitable foraging habitat exists for eight (bobolink, chimney swift, field sparrow, grasshopper sparrow, prairie warbler, red-headed woodpecker, rusty blackbird, and wood thrush) of the fifteen migratory bird species with potential to occur in the proposed project area. Should mature individuals occur on site, they are expected to flush if disturbed. No direct mortality to foraging adults is anticipated, as actions are proposed to occur during the non-breeding season. Suitable nesting habitat was observed in grassy areas and forest edges in the proposed project area for bobolink, field sparrow, grasshopper sparrow, prairie warbler, and red-headed woodpecker. Individual nests, eggs, and juveniles of these species would not be impacted as actions are currently proposed to occur outside of the nesting season. The proposed actions are in compliance with the National Bald Eagle Management Guidelines (USFWS 2007). The remaining species would not likely be present during the breeding season either because habitat requirements are lacking or because breeding range occurs outside of Montgomery County (National Geographic 2002). Populations of migratory birds are not expected to be impacted by the Action Alternative.

3.6. Endangered and Threatened Species

Endangered species are those determined to be in danger of extinction throughout all or a significant portion of their range. Threatened species are those determined likely to become endangered within the foreseeable future. Section 7 of the ESA requires federal agencies to consult with the USFWS when proposed actions may affect endangered or threatened species or critical habitats. The ESA provides broad protection for species of fishes, wildlife, and plants that are listed as threatened or endangered in the U. S. The policy of the U. S. Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes.

The State of Tennessee provides legal protection for species considered threatened, endangered, or deemed in need of management within the state other than those federally listed under the ESA. The legal listing is handled by TDEC; however, the Tennessee Natural Heritage Program and TVA both maintain databases of species that are considered threatened, endangered, of special concern, or tracked in Tennessee. Species listed under the ESA or by the State (see Table 3-3) are discussed in this section.

3.6.1. Affected Environment

3.6.1.1. Aquatic Animals

A query of the TVA Regional Natural Heritage database indicated nine federally listed and eight state-listed or special status species have been documented as potentially occurring within the Elk Fork- Red River 10-digit HUC watershed encompassing the proposed project area (Table 3-3). Three state-listed species are considered extant within the Elk Fork-Red River watershed: southern cavefish, onyx rocksnail, and rugged hornsnail. The remaining species are possibly historic. The Tennessee clubshell is pending listing and is unlisted at the state level. The onyx rocksnail, rugged hornsnail, and Tennessee clubshell all require flowing water year-round. The proposed project area lacks suitable habitat for onyx rocksnail, rugged hornsnail, and southern cavefish as the only channels present are WWCs/ephemeral streams.

3.6.1.2. Vegetation

A June 2025 query of the TVA Regional Natural Heritage database indicated that no federally or state-listed plant species have been previously reported from within a five-mile vicinity of the proposed project area. Two federally listed species are known from Montgomery County. An iPaC query of the project area resulted in no federally listed species and no critical habitat for plant species occurring in the project area.

Aerial photos, site photos, topographic maps, knowledge of rare plant habitats, and field surveys of the project area indicated that federally listed plant species do not occur in the project area.

Table 3-3. Federally and State-listed Species from Proposed Hampton Station 500-kV Substation Project Area [1] within Mongomery County, Tennessee

Common Name	Scientific Name	Federal Status[2]	State Status[2]	State Rank[3]
Aquatic Animals				
Fishes				
Redlips Darter	*Etheostoma maydeni*	–	T	S2
Slenderheaded Darter	*Percina phoxocephala*	–	D	S3
Smallscale Darter	*Etheostoma microlepidum*	–	D	S2
Southern Cavefish	*Typhlichtys subterraneus*	–	D	S3
Mussels				
Mountain Creekshell	*Villosa vanuxemensis*	–	T	S2
Smooth Rabbitsfoot	*Quadrula cylindrica cylindrica*	T	T	S2
Tennessee Clubshell	*Pluerobema oviforme*	PE	–	S2S3
Snails				
Onyx Riversnail	*Leptoxis praerosa*	–	S	S3S4
Rugged Hornsnail	*Pleurocera alveare*	–	S	S3S4
Terrestrial Animals				
Amphibians				
Barking tree frog	*Hyla gratiosa*	–	–	S3
Birds				
Bald eagle[5]	*Haliaeetus leucocephalus*	DM	–	S3B, S2N
Osprey	*Pandion haliaetus*	–	–	S3B
Whooping crane[5]	*Grus americana*	E, EXPN	–	SX
Insects				
Monarch butterfly[5]	*Danaus plexippus*	PT	–	S4
Mammals				
Gray bat[4]	*Myotis grisescens*	E	E	S2
Indiana bat	*Myotis sodalis*	E	E	S1
Northern long-eared bat[4]	*Myotis septentrionalis*	E	E	S2S3
Tricolored bat[4]	*Perimyotis subflavus*	PE	–	S3

[1] Sources: TVA Regional Natural Heritage database (accessed September 2024; January 2025); USFWS Ecological Conservation Online System (http://ecos.fws.gov/ipac) (accessed March 2025).
[2] Status Codes: D or DM = Deemed in Need of Management; E = Listed Endangered; EXPN = Experimental Population, Non-Essential; T = Listed Threatened; PE = Proposed Endangered; PT = Proposed Threatened; S = Special Concern
[3] State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Abundant/Apparently Secure; SX = Species likely extirpated from state; S#B = Rank of Breeding Population; S#N = Rank of Non-breeding Population.
[4] Federally listed species which are known to occur from Montgomery County, Tennessee, but not within three miles of the project.
[5] Federally listed or federally proposed species that has not been documented within three miles of the project area or from Montgomery County; USFWS has determined this species has the ability to occur in the project area.

3.6.1.3. Wildlife

The TVA Regional Natural Heritage database identified two state-listed species (barking tree frog and osprey), and one federally listed terrestrial animal species (Indiana bat) within three miles of the project area. Two additional federally listed species (gray bat and northern long-eared bat) and one species proposed for federal listing (tricolored bat) are known to occur from Montgomery County. The federally listed whooping crane and

federally proposed monarch butterfly are thought by USFWS to have the potential to occur in Montgomery County, though no records of their presence are known to date (Table 3-3).

Species Accounts

Bald eagles are protected under the Bald and Golden Eagle Protection Act. This species is associated with larger mature trees capable of supporting its massive nest. Bald eagles are usually found near larger, perennial waterways where they forage. Active nesting for bald eagles typically occurs from November 1st to June 30th in the region. Potentially suitable nesting habitat occurs in the project area in mature trees along the property boundary. Both ponds within the proposed project area are small and are not suitable for bald eagle foraging. No bald eagle records are known from Montgomery County; however, the USFWS has determined this species has the potential to occur in the project area.

Barking tree frog is a state-listed species found in pine savannahs, wet woodlots, and shallow swamps. Adults typically feed on arthropods and other small invertebrates. To avoid predation, this species usually reproduces in shallow water bodies where fish are not present. Potentially suitable habitat for this species is present in both ponds and the wetland within the project area. Three records of this species are known within three miles of the project area; the nearest occurs approximately 0.65 miles from the project actions.

Gray bats are associated with caves year-round, migrating between different roosts in winter and summer. This species emerges at dusk to forage for insects along waterways. Fourteen gray bat records are known from Montgomery County; the nearest occurs approximately 3.66 miles from the project. Nineteen cave records are known within three miles; the nearest occurs approximately 2.54 miles from the proposed actions. No additional caves or similarly suitable habitat were observed during field review in November 2024. Marginally suitable gray bat foraging habitat and drinking water is present year-round over both ponds and ephemerally over the wetland in the project area.

Indiana bats inhabit caves during winter and migrate to roost under exfoliating bark and within cavities of trees (typically greater than or equal to 5 inches in diameter) during summer. Foraging occurs along riparian areas and along the tops of trees, forested edges, and tree lines. Some habitat requirements overlap between Indiana bat and northern long-eared bat, which roost in caves or cave-like structures in winter and utilize cave-like structures as well as live and dead trees (typically greater than or equal to 3 inches in diameter) with exfoliating bark and crevices in the summer. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas. The project area consisted primarily of open fields with two ponds, one wetland, and portions of fragmented forest. Assessment of the project area for the presence of summer roosting habitat for Indiana bat and northern long-eared bat was conducted in November 2024, followed the USFWS survey guidelines (USFWS 2024) and documented no suitable roosting trees within the 0.75-acre portion of forested habitat proposed for removal. Tree removal is proposed to occur between November and December 2026. Nineteen cave records are known within three miles, the nearest of which occurs approximately 2.54 miles from the proposed actions. No additional caves or similarly suitable habitat were observed during field review in November 2024. Indiana bat records are known from Montgomery County; the nearest known record occurs from 2014 approximately 1.24 miles from the proposed actions. Thirty-eight northern long-eared bat records are known from Montgomery County; the nearest record is from 2012 and occurs approximately 3.66 miles from the proposed actions.

Monarch butterflies are a highly migratory species, with eastern U. S. populations overwintering in Mexico. This species is proposed to be federally listed as Threatened. Summer breeding habitat in the U. S. requires milkweed plant species, on which adults exclusively lay eggs for larvae to develop and feed on. Adults will drink nectar from other blooming wildflowers when milkweeds are not in bloom. Suitable early successional habitat is present in the proposed project area; however, no milkweed was observed during field review conducted in November 2024.

Osprey, a state-listed species, establish nests near water, constructing large stick nests in trees or on artificial structures such as utility poles, navigation markers, and nesting platforms. Ospreys forage in larger, permanent bodies of water. Two osprey nest records are known within three miles. The nearest osprey nest record is located within the proposed project area on an existing transmission structure. However, the field survey conducted in November 2024 determined this nest is no longer present. Suitable foraging habitat is not present within the project area for osprey.

Tricolored bat is proposed to be federally listed as Endangered. This species is generally solitary or found in small groups. They are associated with forested landscapes where they forage near trees and along waterways, especially riparian areas. Maternity and other summer roosts are mainly in dead or live tree foliage. Caves, mines, culverts, and rock crevices may be used as night roosts and hibernacula. Nineteen cave records are known within three miles, the nearest occurring approximately 2.54 miles from the proposed actions. No additional caves or similarly suitable habitat were observed during field review in November 2024. Three tricolored bat records are known from Montgomery County, the nearest occurs approximately 3.66 miles from the proposed project area.

Whooping cranes migrate through Tennessee twice per year in small flocks. During this migration they stop to feed and rest in wetland complexes, marshes, ponds, lakes, rivers, and agricultural fields. Since 2007, a small group of atypical individuals have come to winter in Tennessee, in a rural area on the Cumberland River. The whooping crane is listed as Endangered in the Southwest/USFWS Region 2. Outside of this region, the whooping crane is categorized as a non-essential experimental population. For the purposes of consultation, non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land (require consultation under 7(a)(2) of the ESA) and as a proposed species on private land (no section 7(a)(2) requirements, but Federal agencies must not jeopardize their existence (section 7(a)(4)) (USFWS 2023). The USFWS has determined that this species has the potential to occur in the project area; however, no records are currently known from Montgomery County.

3.6.2. Environmental Consequences

3.6.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the new substation, switchyard, or transmission lines. No impacts would occur to federally or state-listed endangered or threatened aquatic species or critical habitats as a result of TVA actions.

Under the No Action Alternative, no impacts would occur to federally or state-listed plant species. No habitat capable of supporting listed species occurs in the proposed project area where work would occur. Changes to local plant communities resulting from natural ecological processes and human-related disturbance would continue to occur, but the changes would not be the result of the proposed project.

Threatened and endangered terrestrial animals and their habitats would not be affected under the No Action Alternative.

3.6.2.2. Alternative B – Action Alternative

3.6.2.2.1. Aquatic Animals

As stated in Section 3.3 Aquatic Ecology, two WWCs/ephemeral streams (E001 and E002) and the 0.08-acre pond P002 would be permanently affected by the proposed action.

TVA considers all records of federally listed species as well as those species under review for listing. The Elk Fork-Red River watershed contains federally designated critical habitat for the federally threatened rabbitsfoot mussel. However, there is no suitable habitat in the project area. Therefore, the proposed project is not anticipated to result in impacts to unique or important aquatic habitats. Project activities would not involve moving aquatic species or water from different locations, and equipment and materials used for the project would be clean and free of debris that could introduce exotic species and adversely affect aquatic habitat. Thus, the project would not contribute to the spread of exotic or invasive aquatic species.

All work would be conducted in accordance with BMPs as outlined in TVA 2022. These BMPs are designed in part to minimize erosion during construction in order to prevent silt and sediment from entering adjacent waterways, thus reducing the potential for impacts to aquatic threatened and endangered species and general aquatic ecology. The water features documented in the September 2024 field survey of the proposed project area are small, WWC/ephemeral stream drainages lacking perennial flow and would not provide suitable habitat for any of the endangered, threatened, or special status species listed in Table 3-3. Two ponds were identified in the project area. Pond P001, observed in the northeast corner of the proposed substation parcel (Figure 3-2), is fed by two WWC/ephemeral streams and did not contain fish. Pond P002 (0.08-acre), located in the north central portion of the substation parcel, contained mosquito fish. It is unlikely that any special status species would be present in either pond due to the lack of perennial flow at the outflow of the pond. Therefore, with proper implementation of BMPs during construction, operation, and maintenance of the proposed substation and transmission line connections, no impacts to federally listed endangered, threatened, special status, or state-listed aquatic species are anticipated to occur as a result of the proposed Action Alternative.

3.6.2.2.2. Vegetation

Adoption of the Action Alternative would not impact federally or state-listed plant species because no individual plants or habitat capable of supporting listed species are present in portions of the project area where work would occur. Construction of the substation and transmission lines would result in some vegetation clearing, but these disturbances would have no impact on federally or state-listed plants.

3.6.2.2.3. Wildlife

Bald eagles could potentially occur in the proposed project area. Two ponds (P001 and P002 in Figure 3-3) are present; however, based on the size of these ponds and the presence of thick vegetation covering the water source, zoologists determined these water bodies are not suitable for foraging bald eagles. No nests or individuals were observed during field review of the project area in November 2024. The proposed actions are in compliance with the National Bald Eagle Management Guidelines (USFWS 2007). Proposed actions would have no effect on bald eagle.

Barking tree frogs potentially occur in the project area. Potential habitat for this species is present in and around two ponds and one wetland within the project area. No barking tree frog individuals or eggs were observed during field review, though field surveys occurred outside of breeding season in November 2024. One pond (P002) and one wetland (W001), in the north central portion of the proposed substation parcel, would be filled to create the substation (Figures 3-2 and 3-3). Individuals may be impacted or displaced into adjacent, similarly suitable habitat if they are present in the project area during the proposed action timeframe. BMPs would be used around the pond P001 in the northeast corner of the substation parcel to minimize impacts to hydrology and water quality in the project area to the extent practicable. Given the scope of the proposed actions, including size of the pond (0.08-acre) and wetland (0.31-acre) to be filled, potential impacts to barking tree frog populations associated with the proposed Action Alternative are expected to be minor.

Gray bat foraging habitat is present over the two small ponds and ephemeral foraging habitat is present over the one wetland in the proposed project area. BMPs would be implemented around the pond in the northeast corner of the substation parcel to minimize potential impacts to some of the waterbodies within the project area. However, one pond and one wetland within the north central portion of the proposed substation parcel would be filled to build the substation. No caves, cave-like structures, or other similarly suitable habitat is known within the project area based on field review conducted in November 2024. Considering the scope and timing of the proposed actions, the Action Alternative would not significantly impact gray bat.

Indiana bat and northern long-eared bat foraging habitat exists over the two ponds and over the one wetland within the proposed project area. BMPs would be utilized around the pond in the northeast corner of the proposed substation parcel to minimize impacts to some of the hydrology within the project area. The pond and wetland in the north central portion of the proposed substation parcel would be filled to construct the substation. Additional foraging habitat, however, exists within forested areas along the periphery of the Project Area. Approximately 0.75 acres of suitable foraging habitat would be removed in association with the proposed actions. However, similarly suitable foraging habitat is plentiful in the surrounding landscape. Suitable summer roosting habitat for these species is not present within the forested acreage proposed for removal. No caves, cave-like structures, or other winter hibernacula suitable for these species exist in the Project Area or would be impacted under the Action Alternative. There is one house present on the property which is proposed for demolition. A field survey in November 2024 confirmed signs of bat usage are not present within this structure. Tree clearing is proposed to occur between November and December 2026, when neither Indiana bat nor northern long-eared bat are present on the landscape.

Monarch butterfly eggs and larvae may be directly impacted during construction, if present. Future ROW vegetation management would ultimately benefit this species as ROWs have the potential to provide a network of high-quality, connected habitats that support monarch populations, particularly in regions where natural grasslands have been lost. Within the proposed substation boundary, gravel would be added to the site to discourage vegetation growth. The Action Alternative would not jeopardize the continued existence of monarch butterfly.

The two ponds and one wetland present within the proposed substation parcel do not present suitable foraging habitat for osprey. No additional nests were observed during on-site field surveys conducted in November 2024. Tree clearing is proposed to occur

between November and December 2026 when osprey are not typically in the region. Considering the timing of proposed vegetation removal, lack of foraging habitat, and lack of documented nests within 660 feet of the proposed project area, the Action Alternative would have no effect on osprey.

Tricolored bat foraging habitat exists over the two ponds and one wetland within the proposed project area. BMPs would be utilized around the pond in the northeast corner of the proposed substation parcel; however, the wetland in the north central portion of the proposed substation parcel would be filled under the proposed Action Alternative. Additional foraging habitat for this species exists within the forest in and along the periphery of the proposed project area. Foraging habitat would be removed in association with the Action Alternative. However, similarly suitable foraging habitat is plentiful in the surrounding landscape. No caves, cave-like structures, or other winter hibernacula for this species exists in the proposed project area or would be impacted by the proposed Action Alternative. Tree removal is proposed for winter 2026. Tree removal could impact or displace tricolored bats that may be present within the 0.75 acres of proposed tree removal.

One small (0.31 acre) wetland occurs within the north central portion of the proposed substation parcel. This may provide marginally suitable foraging habitat for migratory whooping crane. However, no documented occurrence of whooping crane is known from the proposed project area or from Montgomery County. Proposed actions would not jeopardize the continued existence of whooping crane.

Activities associated with the Action Alternative were addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) that was completed in April 2018 and updated in 2023 and 2024. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures when impacts to federally listed bat species are expected. Relevant conservation measures to this project are identified in the Bat Strategy Project Review form (Appendix F, Table 4) and must be reviewed and implemented as part of the approved project. Considering the scope and timing of the project, proposed actions under the Action Alternative would not significantly impact gray bat, Indiana bat or northern long-eared bat. The Action Alternative would not jeopardize the continued existence of tricolored bat.

The Action Alternative would not result in significant impacts on any terrestrial animal species or their habitats.

3.7. Wetlands

3.7.1. Affected Environment

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

Wetland assessments were performed to ascertain wetland presence, condition, and extent to which wetland functions are provided within the proposed project area. Field surveys were conducted in May and November 2024, to delineate wetland areas potentially affected by the proposed Action Alternative. One fringe wetland was identified as W001, around the 0.08-acre pond (P002), in the north central portion of proposed substation parcel (Figures 3-2 and 3.3). An additional field survey was conducted in July 2025 to confirm wetland acreage and quality for W001.

Activities in wetlands are regulated by state and federal agencies to ensure no net loss of wetland resources. Under CWA §404, activities resulting in the discharge of dredge or fill material to waters of the U. S., including wetlands, must be authorized by the USACE through a Nationwide, Regional, or Individual Permit to ensure no more than minimal impacts to the aquatic environment. Section §401 of the Clean Water Act requires state water quality certification for projects in need of USACE approval. In Tennessee, TDEC is responsible for issuance of water quality certifications pursuant to Section 401 of the CWA (33 U.S.C. 1251, 1341) regarding regulated waters of the State. EO 11990 requires federal agencies to avoid construction in wetlands and minimize wetland degradation to the extent practicable. Wetland determinations were performed according to the USACE standards, which require documentation of hydrophytic (wet-site) vegetation, hydric soil, and wetland hydrology (Environmental Laboratory 1987; USACE 2020; USACE 2012). The USACE defines vegetative cover stratums as:

- Trees/Forest: Woody plants, excluding woody vines, approximately 20 feet or more in height and 3 inches or larger in diameter at breast height.
- Shrub stratum: Woody plants, excluding woody vines approximately 3 to 20 feet in height.
- Herb/emergent: All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 feet in height.

Using the Tennessee Rapid Assessment Method (TRAM) wetlands were evaluated by their functions and classified into three categories: low, moderate quality, or exceptional resource value (Table 3-4) (TDEC 2017).

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

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

- Exceptional resource value wetlands offer high functions and values within a watershed or are of regional/statewide concern. These wetlands may exhibit little to no recent disturbance, provide substantial large scale stormwater storage, sediment retention, and toxin absorption, contain mature vegetation communities, or offer habitat to rare species. Conditions in exceptional quality wetlands often represent restoration goals for wetlands functioning at a lower capacity.

Table 3-4. Wetlands Located within the Proposed Hampton Station 500-kV Substation Parcel

Wetland Identifier	Wetland Type[1]	TRAM[2] Functional Capacity (Score)	Wetland Acreage within the Project Area	Wetland HUC10	Wetland HUC Name
W001	PSS1F	Low (42) [2]	0.31	0513020607	Elk Fork-Red River
Total Acres			**0.31**		

[1]Classification codes as defined in Cowardin et al. (1979): P=Palustrine; F=Semi-permanently flooded; SS1=Scrub-shrub, Broad-leaved deciduous;
[2]TRAM = Tennessee Rapid Assessment Method that categorizes wetland quality by their functional capacity

The proposed project location traverses a mostly rural landscape, dominated by agricultural fields with interspersed suburbs and commercial land use. The project area is located across the Elk Fork-Red River (0513020607) 10-digit HUC watershed. The project area for the Action Alternative was field surveyed to identify actual wetland extent and quality. One wetland, W001, complex, totaling 0.31 acres, was identified within the proposed project area on the fringe of the 0.08-acre pond, P002, located in the north central portion of the proposed substation parcel nestled in a concave depression in the shoulder slope of a gradually sloped wheat field (Figure 3-3; Table 3-4).

The combination of land-use practices and landscape position dictates the wetland habitat type, wetland functional capacity, and wetland value. The identified wetland consisted of scrub-shrub habitat, exhibiting low condition, thus providing poor wetland value to the surrounding landscape (Tables 3-5 and 3-6).

Table 3-5. Acreage of Wetlands Representing Low, Moderate, or Exceptional Resource Value within the Proposed Substation Parcel and Relative to Total Mapped Wetland Occurrence within the Watershed

Watershed (10-HUC)	NWI* Estimated Total Wetland Acres in Watershed*	Delineated Wetland Acreage within the Proposed Substation Parcel			
		Low Value	Moderate Value	Exceptional Resource Value	TOTAL
Elk Fork-Red River (0513020607)	**2,249.70**	0.31	0	0	**0.31**

*National Wetland Inventory (NWI) (USFWS 1982)

Table 3-6. Acreage of Wetlands by Habitat Type within the Proposed Substation Parcel and Relative to Total Mapped Wetland Occurrence within the Watershed

Watershed (10-HUC)	NWI Estimated Total Wetland Acres in Watershed	Delineated Total Wetland Acreage within the Proposed Substation Parcel			
		Emergent	Scrub-Shrub	Forested	TOTAL
Elk Fork-Red River (0513020607)	**2,249.70**	0	0.31	0	**0.31**

Scrub-shrub wetlands are dominated by woody vegetation generally less than 15 feet tall and three inches diameter (Cowardin et al. 1979). This habitat type totaled approximately 0.31 acres across one delineated wetland area (W001) within the project area (Table 3-6, Table 3-7). The scrub-shrub wetland habitat encountered comprised 0.5 percent of the total estimated scrub-shrub wetland habitat across the Elk Fork-Red River watershed (Table 3-7).

The delineated wetland area contained indicators of wetland hydrology influencing soil physiology such that coloration indicative of wetland conditions were evident in the soil profile. The wetland identified was dominated by common wetland vegetation including Black Willow, Japanese Stiltgrass, and Poison Hemlock. Scrub-shrub wetland habitat encountered scored as low-quality using TRAM, indicating poor quality, due to size, surrounding land use, and evidence of disturbance (e.g. mowing, agriculture, etc.) (Table 3-4; Table 3-7).

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

Watershed (10-HUC)	NWI Estimated Scrub-shrub Wetland Acres in Watershed	Delineated Scrub-shrub Wetland Acreage in the Proposed Project Area			
		Low Value	Moderate Value	Exceptional Resource Value	TOTAL
Elk Fork-Red River (0513020607)	**63.09**	0.31	0	0	**0.31**

3.7.2. Environmental Consequences

3.7.2.1. Alternative A – No Action

Under the No Action Alternative, the proposed project would not proceed. As such, no project related disturbance to wetlands within the proposed project area would occur. Therefore, no wetlands would be affected.

3.7.2.2. Alternative B – Action Alternative

Activities in wetlands are regulated by state and federal agencies to ensure no net loss of wetland resources. Efforts were made during project planning and siting to avoid wetlands to the extent practicable. However, because of project and topographic constraints, and because of the goal of minimizing impacts to other resources, no practicable alternative

was available that would allow complete avoidance of wetlands. The process for detecting and avoiding wetland resources identified during the office level review, prior to field surveys, is described in Section 2.3.2.

Under the Action Alternative, the proposed substation and associated transmission lines would be constructed. The proposed project area contains a total of 0.31 acres of scrub-shrub wetlands (Table 3-6). No additional wetlands were found on the proposed substation parcel, access roads or transmission line ROWs. The feature W001 would be located within the proposed substation footprint (Figures 3-2 and 3-3) and would require the fill of 0.31 acres of wetlands (Table 3-8).

Table 3-8. Wetland Impacts within the Proposed Project Area

Wetland Identifier	Impact Type	Acreage of Wetland Impacts
W001	Fill for substation construction	0.31
	TOTAL ACRES	**0.31 Acres**

Wetland fill to accommodate construction is regulated under Section 404 of the CWA. Therefore, wetland loss is subject to the authority of the regulatory agencies to ensure no net loss of wetland functions and values, per the directive of the CWA and the federal no net loss of wetland policy (EPA 1990). The CWA authorizes regulatory oversight for these impacts. The USACE and TDEC exert this oversight through an established permit process that ensures maintenance of the physical, biological, and chemical integrity of national and state waters, including wetlands, and the objectives of the CWA are upheld. The permitting process involves a demonstration of wetland avoidance, minimization of disturbance, and compensation for loss of wetland functions and values. In compliance with the CWA and EO 11990, TVA has considered all options to avoid and minimize wetland impacts, resulting in the least wetland disturbance practicable (Section 2.1).

With wetland avoidance and wetland minimization techniques in place, TVA would comply with all USACE/TDEC mitigation requirements to compensate for the proposed loss of wetland resources, functions, and values resulting from the Action Alternative. TVA would obtain the necessary Section 404 and 401/ARAP permits and required compensatory mitigation to ensure the proposed wetland impacts are compensated to the extent deemed appropriate such that wetland functions and values remain at the current capacity within the larger affected watershed. Any potential unavoidable wetland impacts would be mitigated under regulations implementing Sections 401 and 404 of the CWA, applicable state regulation, and EO 11990 Required compensatory mitigation would be purchased through an approved wetland mitigation bank per the directive of the USACE and Tennessee to ensure no more than minimal impacts to the aquatic environment result and the objectives of the CWA and Tennessee's anti-degradation policy are upheld.

The analysis of wetland effects takes into account wetland loss and habitat conversion at a watershed scale currently and within the reasonable and foreseeable future. Loss of wetland habitat due to wetland fill would be compensated through wetland mitigation banking. Loss of wetland functions and values from wetland fill would be compensated for at the discretion of the USACE engineer. Wetland fill for this project would take place across one watershed. A proposed 0.31 acres of scrub-shrub wetland fill would occur in

the Elk Fork-Red River (0513020607) watershed comprising 0.5 percent of mapped scrub-shrub wetlands within the watershed.

Similarly, general trends in wetland impacts resulting from development within the watershed would be subject to CWA, USACE, and TDEC mandates, and these regulatory requirements are in place to ensure wetland impacts within the watershed are minimized. In this context, the proposed wetland impacts should be kept to a minimum on a watershed scale due to the avoidance, minimization, and compliance measures in place. Therefore, in compliance and accordance with the CWA, the directives of USACE and TDEC, and EO 11990, ensuring no more than minimal adverse effects on the aquatic environment, the Action Alternative's impacts to wetlands would be insignificant.

3.8. Aesthetics

3.8.1. Visual Resources

3.8.1.1. Affected Environment

The classification criteria used in analysis of visual resources are adapted from a scenic management system developed by the U. S. Forest Service (USFS) and integrated with planning methods used by TVA (USFS 1995). Potential visual impacts on cultural and historic resources are not included in this analysis as they are assessed separately in Section 3.9.

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

Views of the landscape are described in terms of what is seen in the foreground, middleground, and background distances. In the foreground, an area within 0.5 miles of the observer, details of objects are easily distinguished. In the middleground, from 0.5 miles to 4 miles from the observer, objects may be distinguishable, but their details are weak and tend to merge into larger patterns. In the distant part of the landscape (the background) details and colors of objects are not normally discernible unless they are especially large, standing alone, or have a substantial color contrast. In this assessment, the background is measured as 4 to 10 miles from the observer. Visual and aesthetic impacts associated with an action may occur as a result of the introduction of a feature that is not consistent with the existing viewshed. Consequently, the visual character of an existing site is an important factor in evaluating potential visual impacts.

For purposes of this visual assessment, the project area includes the proposed 107-acre substation parcel and 0.8- and 0.5-mile transmission lines that would extend north of the substation. The project area is composed of gently sloping terrain. Rural lands (forests and cultivated fields) and areas of moderate development, including commercial and

residential properties, roadways, and existing utility corridors, characterize the landscape. The 107-acre substation parcel is currently an open cultivated field with two small ponds (Figures 3-2 and 3-3). The foreground consists of additional agricultural land and residences, with local collector roadways located to the west and north of the site. Overall, the project location and surrounding area consists of a combination of natural elements, including rolling fields and cultivated areas, with human development including commercial and residential development and transportation and utility corridors.

The composition and patterns of vegetation are the prominent natural features of the landscape within the project area. Apart from crop fields and pasture, vegetation within and surrounding the project area consists of a variety of predominantly deciduous shrubs, brush, and trees. The forms, colors, and textures of the natural features of the project area are typical of northern Tennessee and are not considered to have distinctive visual quality. Therefore, scenic attractiveness of the project area is considered common, due to the ordinary or common visual quality in the foreground, middleground, and background (Table 3-9). The scenic integrity is considered moderate due to noticeable human alteration, including agricultural, transportation, and residential uses. The scenic value class of a landscape is determined by combining the levels of scenic attractiveness, scenic integrity, and visibility and can be excellent, good, fair, or poor. Based on the criteria used for this analysis, the overall scenic value class for the project area is good.

Table 3-9. Visual Assessment Ratings for Project Area

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

In a visual impact assessment, sensitive receptors generally include any scenic vistas, scenic highways, residential viewers, and public facilities or recreational areas located in a project's viewshed. The closest residences are located off Charles Bell Road, immediately adjacent to the east of the 107-acre substation parcel. In addition, as shown in Figure 3-4, there are a number of churches, cemeteries, schools, and recreation areas within the viewshed of the project and transmission ROWs. Most of these facilities occur within the background at a distance of between 4 and 10 miles, near the City of Clarksville. Other than the residents adjacent to the east of the 107-acre substation parcel, there are no sensitive visual receptors located within the foreground.

3.8.1.2. Environmental Consequences

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

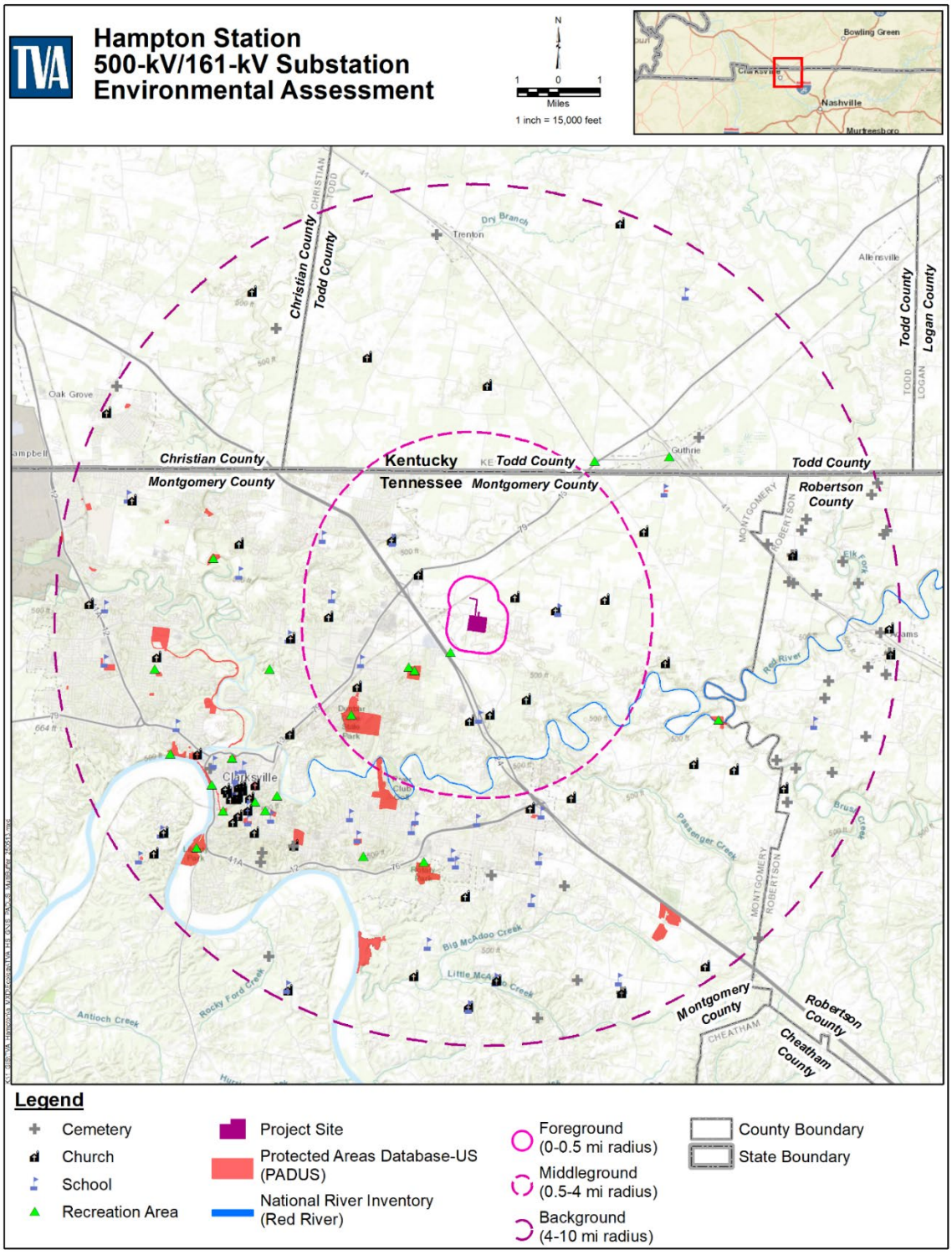

Figure 3-4. Sensitive Visual Receptors Within the Foreground and Middleground of the Hampton Station 500-kV Substation and Transmission Lines

3.8.1.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the substation, switchyard and transmission lines. Thus, landscape character and integrity would remain in its current state and there would be no impact to visual resources resulting from TVA actions.

3.8.1.2.2. Alternative B – Action Alternative

The development of the project could lead to reasonably foreseeable visual effects, including the addition of a new substation, switchyard, and transmission lines to a viewshed that contains existing transmission lines and natural elements. This would result in visible alterations to the existing landscape.

During the approximately 45-month construction period, there would be some visual discord from existing conditions due to an increase in personnel and equipment coupled with disturbances of the current site characteristics. However, this would be contained within the immediate vicinity of the construction activities and would only last until all project construction activities have been completed and the disturbed areas have been seeded and restored using TVA's standard BMPs (TVA 2022). Because of their temporary nature, construction-related impacts to local visual resources would be minor.

Direct views of the substation and switchyard would be limited to residents located off Charles Bell Road, adjacent to the east of the 107-acre substation parcel, and users of local roadways to the west. There are new residences located just east of the tree line, very near the substation parcel boundary. However, the nearest residence would be about 250 feet from the eastern edge of the 35-acre substation/switchyard area within the parcel and approximately 150 feet from the 0.5-mile transmission line and 250 feet from the 0.8-mile transmission line. The existing vegetative buffer of tall trees would block unimpeded views of the proposed facilities. In addition, users of nearby roadways are considered transient motorists who would typically only be exposed to these features for short periods of time. Therefore, the operation of a new substation/switchyard would be noticeable but would not significantly alter the visual integrity of these areas. Similarly, other sensitive receptors in the middleground and background (Figure 3-4) would have minimal, if any, view of the substation and switchyard due to distance and intervening structures and vegetation.

The addition of transmission lines on or near existing structures or within existing ROW increases compatibility with the landscape and minimizes visual impacts. Similarly, other sensitive receptors in the middleground and background (Figure 3-4) would have minimal, if any, view of the new transmission lines due to distance and intervening structures and vegetation.

Necessary security lighting at the substation would generate some additional local light during nighttime hours, which could cause a slight loss of dark sky conditions in the local area. However, lighting is designed to cast light downward and to minimize emissions above the horizontal plane. As described in TVA's *Substation Lighting Guidelines* (TVA 2025), TVA routinely designs substation lighting to accommodate the concerns of nearby residents. The increase in nighttime lighting generated by the substation and switchyard would be localized to the immediate 35-acre substation parcel disturbance area. The project area is influenced by existing development that generates nighttime lighting, including nearby utility infrastructure, roadways, and commercial/industrial activity. Ambient lighting in the viewshed currently exceeds the amount that would be generated by the project. Therefore, illumination from the substation would not contribute to the loss of dark sky conditions or visual effects.

The human alterations already in place within the project area currently contribute some visual discord with the natural landscape. These elements contribute to the landscape's ability to absorb negative visual change. Therefore, while the forms, colors, and textures of the landscape that make up the scenic attractiveness would be affected by the substation, switchyard and transmission line construction, it would remain common or ordinary (Table 3-10). Impacts to scenic integrity are anticipated to be greatest in the foreground of the substation, switchyard and portions of the transmission lines. At this distance, scenic integrity would be reduced, as visual alterations associated with the substation structures and overhead lines would be dominant features on the landscape. However, there would be no change in the ratings for the middleground and background as the alterations associated with the substation would not be substantive enough to dominate the view from these distances (Table 3-10). Based on the criteria used for this analysis, the scenic value class for the affected environment after the proposed modifications would be reduced to fair in the foreground but remain classified as good in the middleground and background. While implementation of the project would contribute to a decrease in visual integrity of the landscape, the existing scenic class would not be reduced by two or more levels, which is the threshold of significance of impact to the visual environment. Therefore, visual impacts resulting from the project would be low to moderate.

Table 3-10. Visual Assessment Ratings for Project Area Resulting from Action Alternative

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

3.8.2. Noise

3.8.2.1. Affected Environment

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

Sound is measured in logarithmic units called decibels (dB). Given that the human ear cannot perceive all pitches or frequencies of sound, noise measurements are typically weighted to correspond to the limits of human hearing. This adjusted unit of measure is known as the A-weighted decibel (dBA), which filters out sound in frequencies above and below human hearing. A noise level change of 3 dBA or less is barely perceptible to average human hearing. However, a 5-dBA change in noise level is clearly noticeable. The noise level associated with a 10-dBA increase is perceived as being twice as loud, whereas the noise level associated with a 20-dBA increase is considered to be four times as loud and represents a "dramatic change" in loudness.

To account for sound fluctuations, environmental noise is commonly described in terms of the equivalent sound level. The equivalent sound level is the constant noise level that conveys the same noise energy as the actual varying instantaneous sounds over a given period. Fluctuating levels of continuous, background, and intermittent noise heard over a

specific period are averaged as if they had been a steady sound. The day-night sound level (Ldn), expressed in dBA, is the 24-hour average noise level with a 10-dBA correction penalty for the hours between 10 p.m. and 7 a.m. to account for the increased sensitivity of people to noises that occur at night. Typical background day-night noise levels for rural areas are anticipated to range between an Ldn of 35 and 50 dB. Higher-density residential and urban areas background noise levels range from 43 dB to 72 dB (EPA 1974). Common indoor and outdoor noise levels are listed in Table 3-11.

There are no federal, state, or local established quantitative noise-level regulations specifying environmental noise limits for the project or the surrounding area. The proposed project would be located in Montgomery County but is outside of the municipality of Clarksville and approximately 3 miles northeast of the community of St. Bethlehem. The 107-acre substation parcel is currently an agricultural field partially surrounded by urban developments and other agricultural fields. The proposed transmission line ROWs are a mix of agricultural and existing utility corridor use. The area to the east of the proposed project consists of a new residential development, agricultural fields and semi-forested land. The area to the west of the project is composed of urban residences, businesses, roadways, and parks, and Interstate 24 (I-24) is located approximately 0.73 miles to the southwest. Ambient noise consists of traffic noise along these nearby roadways and periodic agricultural activities. Due to the nature of the decibel scale and the attenuating effects of noise with distance, a doubling of traffic typically results in a 3 dBA increase in noise levels (Federal Highway Administration [FHWA] 2011).

The noise analysis study area includes the substation parcel, which extends to Charles Bell Road to the north, Steel Stock Road to the west, and 0.73 miles shy of I-24 to the southwest, and it also includes the 0.8- and 0.5-mile transmission lines that would extend north of the substation parcel. This area defines the limits of noise disturbance to accurately assess the potential noise impacts.

Sensitive noise receptors include residences or other developed sites where frequent human use occurs, such as churches, parks, and schools. The closest residential receptors are approximately 10 feet from the 107-acre substation parcel boundary and approximately 250 feet east of the proposed substation location within the 107-acre parcel, approximately 150 feet from the 0.5-mile transmission lines and approximately 1,600 feet from the 0.8-mile transmission lines. The closest roadway traffic is located approximately 36 feet to the west of the project site on Steel Stock Road.

Table 3-11. Common Indoor and Outdoor Noise Levels

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

Source: Arizona Department of Transportation 2008

3.8.2.2. Environmental Consequences

3.8.2.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the project. Therefore, there would be no impacts related to noise under this alternative.

3.8.2.2.2. Alternative B – Action Alternative

3.8.2.2.3. Construction Noise

Reasonably foreseeable effects of the project include construction and operation of the substation, switchyard, and transmission lines, which would contribute to increases in ambient noise.

Project construction would be conducted in phases proposed to start August 2026 and estimated to be completed May 2030. Construction would occur during normal daylight business hours Monday through Friday, but weekend work may be required periodically. Equipment used during the construction phase would include trucks, truck-mounted augers, and drills, as well as tracked cranes and bulldozers. Low ground-pressure-type equipment would be used in specified locations (such as areas with soft ground) to reduce the potential for environmental impacts. Typical noise levels from this equipment are expected to be 85 dBA or less at a distance of 50 feet from the construction equipment (FHWA 2016) except for pile-drivers used to install transmission line poles that may produce noise levels of up to 95 dBA at 50 feet (FHWA 2016). Actual observed noise for the majority of the poles would likely be lower in the field due to increasing distances and where vegetation and topography would cause further noise attenuation. Thus, typical construction noise would fall below the recommended EPA outdoor noise guideline of 55 dBA at all sensitive receptors. that would not contribute to typical background noise levels. Trucks would have a maximum of 50 dBA at 50 feet, while truck-mounted augers (auger drill rig), drills (rock drill), tracked cranes, and bulldozers would have a maximum of 85 dBA at 50 feet (FHWA 2016).

Based on straight line noise attenuation, and if construction occurs at the substation parcel boundary, noise emissions from the project boundary to the closest residential receptor (adjacent to the east) and traffic on Steel Stock Road would exceed 85 dBA. However, substantial construction activity is not anticipated within the entire 107-acre parcel but would occur mainly within the 35-acre boundary of the substation and switchyard within the larger parcel. Therefore, construction activities would be primarily a minimum of 250 feet away from the nearest residence, which would result in noise attenuation of approximately 71 dBA. Transmission line poles for the 0.5-mile transmission line and the 0.8-mile transmission line could be installed as close as 150 feet and 250 feet from the nearest residences, respectively. This would result in noise attenuation of 85 dBA and 81 dBA, respectively. However, these noise levels assume that a transmission structure would be installed for each transmission line at the closest point to the nearest residence, which would result in short-term, isolated noise levels. In addition, a vegetated buffer of tall trees exists between the 107-acre substation parcel and the transmission line locations (project area) and the closest residential receptors, which would help diminish the maximum noise emission levels. The closest roadway traffic noise receptors located on Steel Stock Road would be transient and not exposed to construction noise emissions continuously. Noise reaching all other sensitive noise receptors in the vicinity of the project area would be at a lower dBA.

The EPA's outdoor noise guideline is stated to be 55 dBA at all sensitive receptors. Some construction noise emissions would be temporarily higher than the EPA's recommended Ldn guidelines for residential areas, and slightly higher than the U. S. Department of Housing and Urban Development (HUD) recommendation of 65 dBA. EPA noise guidelines are not regulatory goals but are "intentionally conservative to protect the most sensitive portion of the American population" with "an additional margin of safety" (EPA 1974). The noise generation from augers, drills, cranes, and bulldozers would occur in temporary, isolated events, removing it from the continuous, background, and intermittent noise category that defines equivalent sound level, Ldn, and corresponding levels of sensitivity within the community. For example, a jet flyover at 1,000 feet has a high sound pressure level of approximately 105 dB, but in most environments, it is not a recurring event that would contribute to typical noise levels (Arizona Department of Transportation 2008). In contrast, ongoing noise generated by heavy equipment used during construction activities

would fall under the standard continuous, background, and intermittent noise category that determines Ldn and associated community sensitivity. Additionally, the actual noise would likely be lower in the field, where objects and topography would cause additional noise attenuation.

The construction noise emissions would be temporary and intermittent contributions during daytime hours Monday through Friday to typical background noise levels, but would not fall under the continuous, background, and intermittent noise category that defines Ldn except if construction occurs between the substation boundary and the eastern boundary of the 107-acre substation parcel. The likely construction equipment that may be operated outside of the 35-acre substation area to the east would include equipment used for clearing and grading. Although noise levels at nearby residences may periodically surpass the EPA and HUD's recommended Ldn guidance for residential areas (55 dBA and 65 dBA, respectively), the highest noise levels and activities, such as those associated with drilling and bulldozing, would not be anticipated near the 107-acre substation parcel's eastern boundary and noise would be infrequent. Only a few transmission structures would be installed near residential receptors and this would result in only a short-term noise level above EPA and HUD's recommendations for residential areas. Because construction noise would be temporary in nature and limited to daytime hours, noise impacts from construction of the substation, switchyard, and transmission lines would be minor to moderate.

Roadway traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (FHWA 2011). During peak construction, assuming vehicle occupancy of one person per vehicle, daily workforce traffic would range from 15 to 63 vehicles over a period of approximately three years. Workforce traffic noise would occur twice per day as workers enter and leave the project area. Workforce traffic noise emissions would be negligible further from the site as vehicles disperse throughout the transportation network and assimilate into existing traffic patterns. Overall, given the temporary and intermittent nature of project activities and the relatively low vehicle numbers, noise impacts associated with workforce traffic would be minor.

3.8.2.2.4. Operational Noise

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

Transformers at the substation would generally operate in self-cooled mode, although a few days a year during extreme temperatures transformers would operate in fan-cooled mode. When fans are used, they would generate noise levels of approximately 85 dBA at a distance of three feet, attenuating to levels of approximately 47 dBA at the nearest residential sensitive receptor (250 feet). As this falls within typical background day-night noise levels in residential and urban areas, the fan noise would not generally be audible over background noise at the closest sensitive receptors.

The substation would produce a loud impulse noise when a breaker is tripped due to excessive current, high voltage, low voltage, low frequency, or other less common problems. When such problems occur, the circuit breaker opens to disconnect part of the system, and the flow of current is interrupted. The noise from the breaker is expected to last 1/20 of a second and range from 96 to 105 dBA at a distance of 50 feet. Although breaker noise would be quite loud, it is only expected to occur approximately 18 times each year. Breaker noise may be audible to nearby residents; however, because of the infrequent occurrence, impacts from breaker noise would be minor.

Overall, noise impacts from the operation of the substation would be minor, as the occasional corona discharge and fan cooling would not result in notable changes to background noise levels at nearby receptors and audible breaker noise would be infrequent and short-lived. In addition, the operation and maintenance of transmission lines can result in periodic noise related to line maintenance, vegetation management, and, under certain atmospheric conditions, corona discharge. Noise increases associated with construction would be temporary, and operational noise emissions of the substation would generally attenuate to levels below recommended residential noise levels and would be negligible to minor.

3.9. Land Use and Prime Farmland

3.9.1. Affected Environment

For the proposed project, TVA would acquire a 107-acre parcel of mostly agricultural land, 35 acres of which would be used for the location of a new substation and switchyard, and TVA would acquire an additional 17.5 acres for the new transmission lines and associated ROWs (project area).

The project area is zoned as agricultural (Montgomery County 2025). According to the Montgomery County zoning resolution, an agricultural district is zoned for the proper utilization of those lands best suited for the production of agricultural products (such as field crops, livestock, and other conventional agricultural activities) and to control the encroachment of urban and other incompatible land uses on farmlands (Montgomery County 2024). Land cover within the project area and 1-mile vicinity is shown in Figure 3-5 (Dewitz 2023).

Existing transmission lines are located north of the project area and a single-family residence is located on the northern portion of the 107-acre parcel that would be acquired for the substation and switchyard. There is an additional residential area that has been constructed to the east within the immediate vicinity of the proposed project that is not shown on Figure 3-5. Therefore, the nearest single-family residential areas are located along Charles Bell Road adjacent to the eastern boundary of the 107-acre parcel.

The 1981 Farmland Protection Policy Act (FPPA) and its implementing regulations (7 Code of Federal Regulations [CFR] Part 658) recognizes the importance of prime farmland and the role that federal agencies can have in converting it to nonagricultural uses. The act requires all federal agencies to evaluate impacts to prime and unique farmland prior to permanently converting to land use incompatible with agriculture.

Prime farmland soils have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. These characteristics allow prime farmland soils to produce the highest yields with minimal expenditure of energy and

economic resources. In general, prime farmlands have an adequate and dependable water supply, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. Prime farmland soils are permeable to water and air, not excessively erodible or saturated for extended periods, and are protected from frequent flooding.

In accordance with FPPA evaluation procedures, a U. S. Department of Agriculture (USDA) Farmland Conversion Impact Rating (Form AD-1006) is required for the Hampton Station 500-kV/161-kV Substation Area with input from the USDA Natural Resources Conservation Service (NRCS). As part of that process, a preliminary assessment seeking confirmation of prime farmland in the project area was submitted to the NRCS on May 12, 2025. The NRCS provided a response on May 14, 2025, agreeing with the assessment that prime farmland is present in the project area. Figure 3-6 shows prime farmland within the124-acre project area and within a 1-mile radius of the project area.

The acreage of prime farmland soils present within the 124-acre project area, which includes the 107-acre substation parcel, 14.2 acres for the 0.8-mile transmission line and 3.3 acres for the 0.5-mile transmission line totals 76.7 acres (Table 3-12). An assessment of prime farmland within a 1-mile radius of the project area was also assessed and is also included in Table 3-12 (NRCS 2024).

Table 3-12. Acres of Prime Farmland Soils

Soil Type	Project Area (acres)	1-mile Radius (acres)
All prime farmland soils	76.7	2,175.8
Not prime farmland	48.0	1,527.5
Total	**124.7**	**3,703.3**

Source: NRCS 2024

As shown in Table 3-12, prime farmland is not a unique feature in the vicinity of the project, as approximately 59 percent of soils in a 1-mile radius are considered prime farmland soils. Overall, prime farmland soils within the proposed project area comprise approximately 3.5 percent of the total prime farmland soils found within a 1-mile radius.

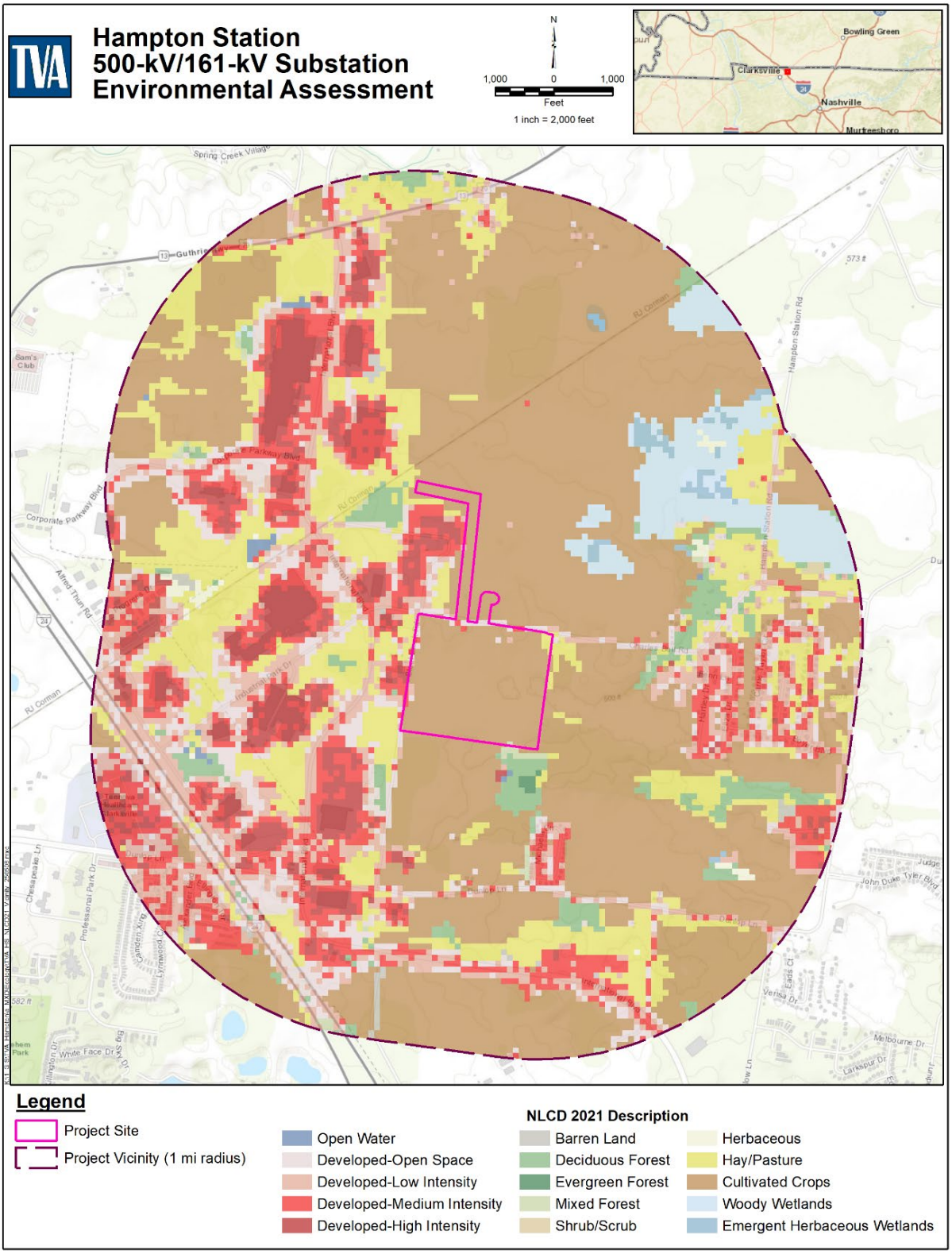

Figure 3-5. Land Cover within the Proposed Project Area and Vicinity

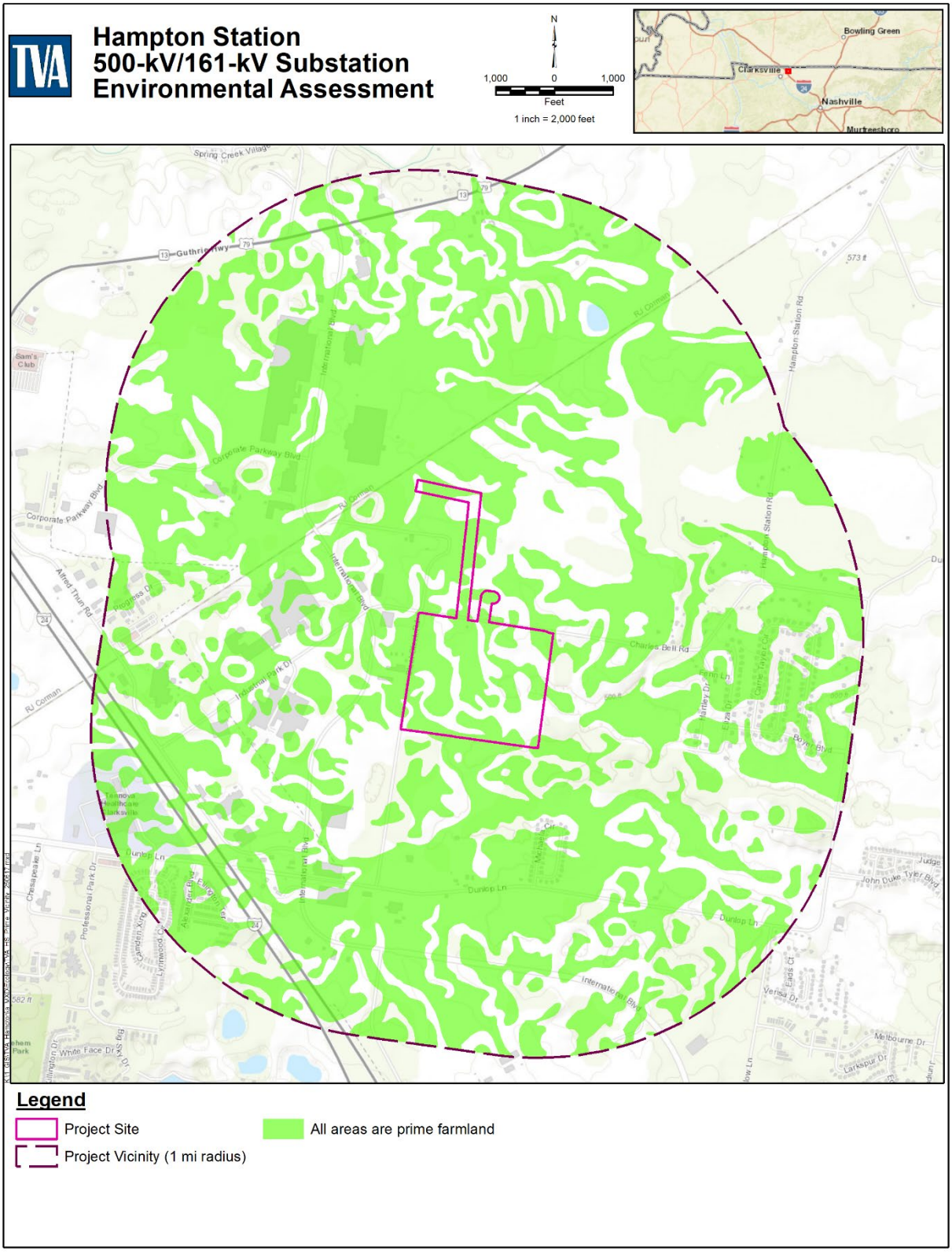

Figure 3-6. Prime Farmland within the Proposed Project Area Vicinity

3.9.2. Environmental Consequences

3.9.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the substation, switchyard, and transmission lines. Therefore, no impacts to land use or prime farmland resources would occur under this alternative.

3.9.2.2. Alternative B – Action Alternative

The proposed project would permanently convert approximately 124.7 acres of agricultural land to utility use. In addition, the single-family residence located on the north portion of the 107-acre substation parcel would be removed. Although land use would be changed from agricultural to utility facilities, the surrounding land use includes an existing utility corridor, and the proposed project would be in keeping with that element. Therefore, impacts on land use would be minor.

Form AD-1006 quantifies the potential impacts to prime farmland. The impact rating considers the acreage of prime farmland to be converted, the relative abundance of prime farmland in the surrounding county, and other criteria such as distance from urban environments, percentage of area currently being farmed, and compatibility with existing agricultural use. This form assigns a numerical rating between zero and 260 based on the area of prime farmland to be disturbed, the total area of farmland in the affected county, and other criteria.

The 124.7-acre project area received an impact rating score of 69.5. The completed AD 1006 Form is provided in Appendix G. Given the availability of prime farmland in the area and the small amount proposed to be removed in a 1-mile radius (3.5 percent) as well as the relatively lower impact rating, impacts to prime farmland would be minor.

3.10. Archaeological and Historic Resources

3.10.1. Affected Environment

Federal agencies are required by Section 106 of the National Historic Preservation Act and by NEPA to consider the possible effects of their proposed actions (or undertakings) on historic properties. The term “historic property” includes any historic or prehistoric site, district, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the National Park Service. “Undertaking” means any project, activity, or program that has the potential to have an effect on a historic property and that is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency. To determine an undertaking’s possible effects on historic properties, a four-step review process is conducted.

These steps include:

- Initiation (defining the undertaking and the APE and identifying the parties to be consulted in the process).
- Identification of historic properties within the APE.
- Assessment of effects to historic properties.
- Resolution of adverse effects by avoidance, minimization, or mitigation.

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

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

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

TVA recommends that the APE for the current undertaking includes the following:

- Areas of potential ground disturbance including:
    - The approximately 107-acre parcel TVA would acquire to construct the new Hampton Station 500-kV Substation;
    - Areas associated with two 0.8-mile-long double-circuit loop lines from the Montgomery-Hemlock No. 1 and No. 2 161-kV Transmission Lines on 200-foot-wide ROW;
    - And areas associated with one 0.5-mile-long double circuit transmission line on 200-foot-wide ROW from the proposed Hampton Station Substation.
- All areas in which the project would be visible within a half-mile radius of the proposed transmission lines and substation.

3.10.1.1. Archaeological Resources

A background and literature search found four archaeological resources (40MT134, 40MT135, 40MT144, and 40MT1391) within the APE (Table 3-13). No cemeteries are documented within the APE.

The archaeological survey of the 107-acre parcel resulted in the investigation of three previously recorded archaeological sites (40MT134, 40MT135, and 40MT1391) (Barbour et al. 2025). Archaeological investigations were confined to the survey area, and it is possible that the archaeological sites were not fully delineated. For that reason, TVA recommends that the NRHP status of the investigated sites are undetermined.

The archaeological survey of the transmission line ROWs resulted in the investigation of one previously identified archaeological site (40MT144) and one newly recorded isolated find (IF1) (Butz et al. 2024). The previously recorded archaeological site was expanded as a result of the current survey and may extend beyond the limits of the survey area. For that reason, TVA recommends that the NRHP status of the investigated site is undetermined.

IF1 lacks research potential beyond the findings of the Phase I survey and is not eligible for NRHP listing under Criterion D.

Due to an inability to yield important information about history or prehistory, as well as insufficient integrity, TVA recommends no additional work or avoidance at the above-described archaeological sites.

Table 3-13. Recorded Archaeological Resources within the Area of Potential Effect

Archaeological Resource	Resource Type	NRHP Eligibility	Recommendation
40MT134	Lithic scatter, unknown temporal affiliation	Undetermined	No further work[1]
40MT135	Lithic scatter, unknown temporal affiliation	Undetermined	No further work[1]
40MT1391	Lithic scatter, unknown temporal affiliation	Undetermined	No further work[1]
40MT144	Lithic scatter, unknown temporal affiliation	Undetermined	No further work[2]
IF1	Lithic scatter, unknown temporal affiliation	Not Eligible	No further work[2]

Source: [1]Barbour et al. 2025; [2]Butz et al. 2024

3.10.1.2. Architectural Resources

During the cultural resources study of the 107-acre substation parcel, an architectural assessment of the APE was also conducted. According to NRHP records, there are no NRHP-listed properties within the APE. Nine architectural resources (Resources 1 – 9) were recorded, of which one is recommended as eligible for listing in the NRHP under Criteria A and C (Resource 6) (Table 3-14). Furthermore, TVA recommends that the remaining eight properties are considered not eligible for NRHP listing under Criteria A, B, or C.

During the cultural resources study of the transmission line ROWs, an architectural assessment of the APE was also conducted. Three architectural resources (MT-1145, MT-1146, and HS-1) were recorded, of which none were recommended as eligible for listing in the NRHP under Criteria A, B, or C (see Table 3-14).

Table 3-14. List of Recorded Architectural Resources within the Area of Potential Effect

Architectural Resource	Recorder	Date/Architectural Style	NRHP Eligibility
1	TerraX[1]	ca. 1970 Linear Ranch	Not Eligible
2	TerraX	ca. 1958 Half-Courtyard Ranch	Not Eligible
3a	TerraX	ca. 1965 Double Crib	Not Eligible
3b	TerraX	ca. 1965 Double Bay Barn	Not Eligible
3c	TerraX	ca. 1940 Transverse Crib	Not Eligible
4	TerraX	ca. 1969 Split-Level	Not Eligible
5	TerraX	ca. 1955 Compact Ranch	Not Eligible
6	TerraX	ca. 1852 MC&L Railroad	Eligible
7	TerraX	ca. 1945 National	Not Eligible
8	TerraX	ca. 1966 Silo	Not Eligible
9	TerraX	ca. 1968 Linear Ranch	Not Eligible
MT-1145	TVAR[2]	ca. 1852 MC&L Railroad	Not Eligible
MT-1146	TVAR	ca. 1954 Ranch house	Not Eligible
HS-1	TVAR	1969 Ranch house	Not Eligible

Source: [1]Barbour et al. 2025; [2]Butz et al. 2024

Resource 6 and MT-1145 both represent the Memphis, Clarksville & Louisville (MC&L) railroad. This resource was initially recommended as not eligible for the NRHP due to a lack of historical and engineering significance, as well as diminished integrity (Butz et al. 2024). Subsequently, a second assessment of this resource determined that it is eligible for the NRHP under Criteria A and C due to the replacement of in-kind materials and the crucial role the MC&L played in the development of Clarksville (Barbour et al. 2025). As noted below, the Tennessee SHPO concurred with the recommendation of both surveys. However, as a result of the additional information provided in the second survey, TVA finds that the resource is eligible for the NRHP.

3.10.2. Environmental Consequences

3.10.2.1. Alternative A – No Action

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

3.10.2.2. Alternative B – Action Alternative

TVA, in consultation with the Tennessee SHPO and federally recognized Indian tribes, found that the project would not adversely affect any listed or eligible NRHP-listed archaeological or architectural sites. The SHPO concurred with TVA's findings in letters dated March 28, 2025 (substation parcel) and November 18, 2024 (transmission line ROW) (Appendix A). TVA received comments from three federally recognized Indian tribes. TVA received concurrence for no adverse effect for the transmission line ROWs from the Eastern Shawnee Tribe of Oklahoma on December 16, 2024, and from the Creek (Muscogee) Nation on December 10, 2024. TVA received concurrence for no adverse effect for the substation parcel from the Eastern Shawnee Tribe of Oklahoma on April 10, 2025.

Should previously undiscovered cultural resources be identified during project site construction or operations, a TVA archaeologist and consulting parties would be consulted before any further action is taken. Therefore, TVA finds that the undertaking, i.e., implementing the Action Alternative, would have no significant impact to historic properties.

3.11. Recreation, Parks, and Managed Areas

3.11.1. Affected Environment

This section describes recreational opportunities and natural areas near the proposed project area. Recreation activities include, but are not limited to, nature walking/hiking, camping, bird watching, fishing, hunting, cycling, picnicking, swimming, playgrounds, outdoor sporting events or any other leisurely pastime conducted on public or privately owned or managed land. Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, USDA, USFS, State of Tennessee) to protect and maintain certain ecological and/or recreational features. Natural areas include ecologically significant sites; federal, state, or local park lands; national or state forests; wilderness areas; scenic areas; wildlife management areas; recreational areas; greenways; trails; Nationwide Rivers Inventory (NRI) streams; and wild and scenic rivers. Ecologically significant sites are either tracts of privately owned land that are recognized by resource biologists or the USFWS as having significant environmental resources, designated critical habitats, or identified tracts on TVA lands that are ecologically significant but not specifically managed by TVA's Natural Areas program.

A desktop-level review of all recreation areas within a 3-mile radius of the project area was conducted utilizing mapping databases such as ArcGIS, Google Earth, and TVA's EGIS. A low, medium, or high impact determination with recommendations are based on the proximity, scale, severity, and duration of the project. Two developed recreation areas were identified to be within a 3-mile radius of the project area (Table 3-15). No recreation areas were identified to overlap with the project area. Some dispersed recreational activities such as hunting, nature observation, hiking, and walking for pleasure may occur on some of the lands within or near the proposed project area and related access routes.

Table 3-15. Recreation Areas within a 3-mile Radius of the Proposed Project Area

Recreation Area	Activities	County	State	Distance from Project Area
Beachaven Vineyards & Winery	Winery for tours and tastings	Montgomery	TN	1.1 miles
St. Bethlehem Civitan Sports Complex	Baseball, soccer fields, playground	Montgomery	TN	2.2 miles

Additional review of TVA's Regional Natural Heritage database identified three managed and natural areas within a 3-mile radius of the proposed project area (Table 3-16).

Table 3-16. Managed and Natural Areas within a 3-mile Radius of the Proposed Project Area

Natural Area	Acres	County	State	Distance from project area
Agricultural Conservation Easement	98.67	Montgomery	TN	2.8 miles
Barkley Reservoir Reservation	81,082.86	Multiple	Multiple	2.9 miles
Red River (Nationwide Rivers Inventory Stream)	232.01	Multiple	Multiple	2.9 miles

3.11.2. Environmental Consequences

3.11.2.1. Alternative A – No Action

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

3.11.2.2. Alternative B – Action Alternative

Installation of the proposed substation would preclude any informal recreational use of the proposed substation property. The Action Alternative has been assessed to have low impacts on localized recreational activities within the proposed project area considering the project area currently consists primarily of agricultural fields. Disturbances to recreational activities/areas may include scenic degradation, increased noise levels and traffic pattern disruptions or congestion due to the transport or use of materials and heavy equipment in or around the project area. These anticipated disruptions should be considered temporary while the project is under construction.

Given their distance from the project area, no impacts to any natural or managed areas are anticipated as a result of the proposed project.

3.12. Socioeconomics

3.12.1. Affected Environment

The project area includes the proposed Hampton Station 500/161-kV Substation and switchyard that would be located on an approximate 107-acre parcel. The project area also includes approximately 0.5 mile of a double-circuit 500-kV transmission line that would extend from the proposed substation to the new LG Chem substation and approximately 0.8 mile of double-circuit 161-kV transmission lines that would extend from an existing TVA-owned transmission line to the proposed substation and switchyard.

3.12.1.1. Demographic and Economic Conditions

The study area for demographic and economic analyses is a 1-mile radius of the 107-acre substation parcel and the transmission alignment that would extend approximately 0.8 mile north adjacent to existing transmission infrastructure. A total of four census block groups (CBGs) in Montgomery County and the state of Tennessee are included, as appropriate, as secondary geographic areas of reference. Comparisons at multiple spatial scales provide more detailed characterizations of populations that may be affected by the project, including minority and low-income populations. Demographic and economic characteristics of populations within the study area were assessed using the most recent U. S. Census Bureau (USCB) data available, including 2020 Decennial Census counts (USCB 2021) for total population and racial characteristics, and 2019–2023 American Community Survey 5-year estimates (USCB 2024a) for the remaining datasets. Demographic and economic characteristics of the block groups that make up the study area and of the secondary reference geographies are summarized in Table 3-17.

The block groups that compose the study area include Block Group 2, Census Tract 1019.04, as well as Block Group 1, Census Tract 1019.04; Block Group 1, Census Tract 1019.06; and Block Group 2, Census Tract 1020.10 in Montgomery County. The study area consists of predominantly agricultural and commercial/industrial development, with rural residential population centers scattered throughout. The city of Clarksville is located approximately 7.1 miles southwest of the substation parcel.

Population trends vary widely by block group. Considered as a whole, the study area population has declined at a rate of approximately 16 percent since 2010; however, block groups within the study area were realigned prior to 2020. Block Group 1020.06 was included in the 1-mile buffer in 2010 and omitted in 2020. Consequently, direct comparisons of population data do not accurately represent population growth in the study area.

Considering the substantial population growth rate in surrounding Montgomery County (approximately 28 percent) and the study area's proximity to Clarksville, it is reasonable to assume that the study area population has experienced similar growth trends.

Most of the population (approximately 63 percent) is white, while approximately 15 percent identify as Black or African American. There are also small numbers who are Hispanic or Latino, American Indian and Alaska Native, Asian, or who identify as two or more races. Minority percentages in the study area are generally comparable to those of Montgomery County and the state of Tennessee, which also have minority populations under 50 percent (Table 3-17). There are four CBGs within the study area, one of which has a minority

population that either exceeds 50 percent of the total population or is meaningfully greater (greater than or equal to 10 percentage points), or both, than the minority population percentage of Mongomery County or the state of Tennessee (Figure 3-7).

Table 3-17. Demographic and Socioeconomic Characteristics

	Study Area (Summary of 4 Block Groups)	Montgomery County, Tennessee	State of Tennessee
Population[a] [b] [c]			
Population, 2020	9,525	220,069	6,910,840
Population, 2010	11,399	172,331	6,346,105
Percent Change 2010-2020	-	27.7%	8.9%
Persons under 18 years, 2023	30.4%	26.9%	22.3%
Persons 65 years and over, 2023	8.4%	9.8%	16.8%
Racial Characteristics[a]			
Not Hispanic or Latino			
White alone, 2020 [d]	62.7%	59.7%	70.9%
Black or African American, 2020 [d]	14.8%	19.7%	15.7%
American Indian and Alaska Native, 2020 [d]	0.3%	0.3%	0.2%
Asian, 2020 [d]	5.0%	2.3%	1.9%
Native Hawaiian and Other Pacific Islander, 2020 [d]	0.4%	0.4%	0.1%
Some Other Race alone, 2020 [d]	0.6%	0.5%	0.3%
Two or More Races, 2020	6.9%	6.6%	3.9%
Hispanic or Latino, 2020	9.3%	10.4%	6.9%
Income and Employment[c]			
Per capita income, 2023	$42,790	$33,645	$37,866
Persons below poverty level, 2023	10.6%	11.6%	13.8%
Persons below low-income threshold, 2023 [e]	21.4%	29.5%	32.1%
Civilian Labor Force, 2023	7,199	102,885	3,465,315
Percent Employed, 2023	96.1%	94.5%	95.3%
Percent Unemployed, 2023	3.9%	5.5%	4.7%

Notes:
(a) USCB 2011
(b) USCB 2021
(c) USCB 2024a
(d) Includes persons reporting only one race
(e) Low-income threshold is defined as two times the poverty level

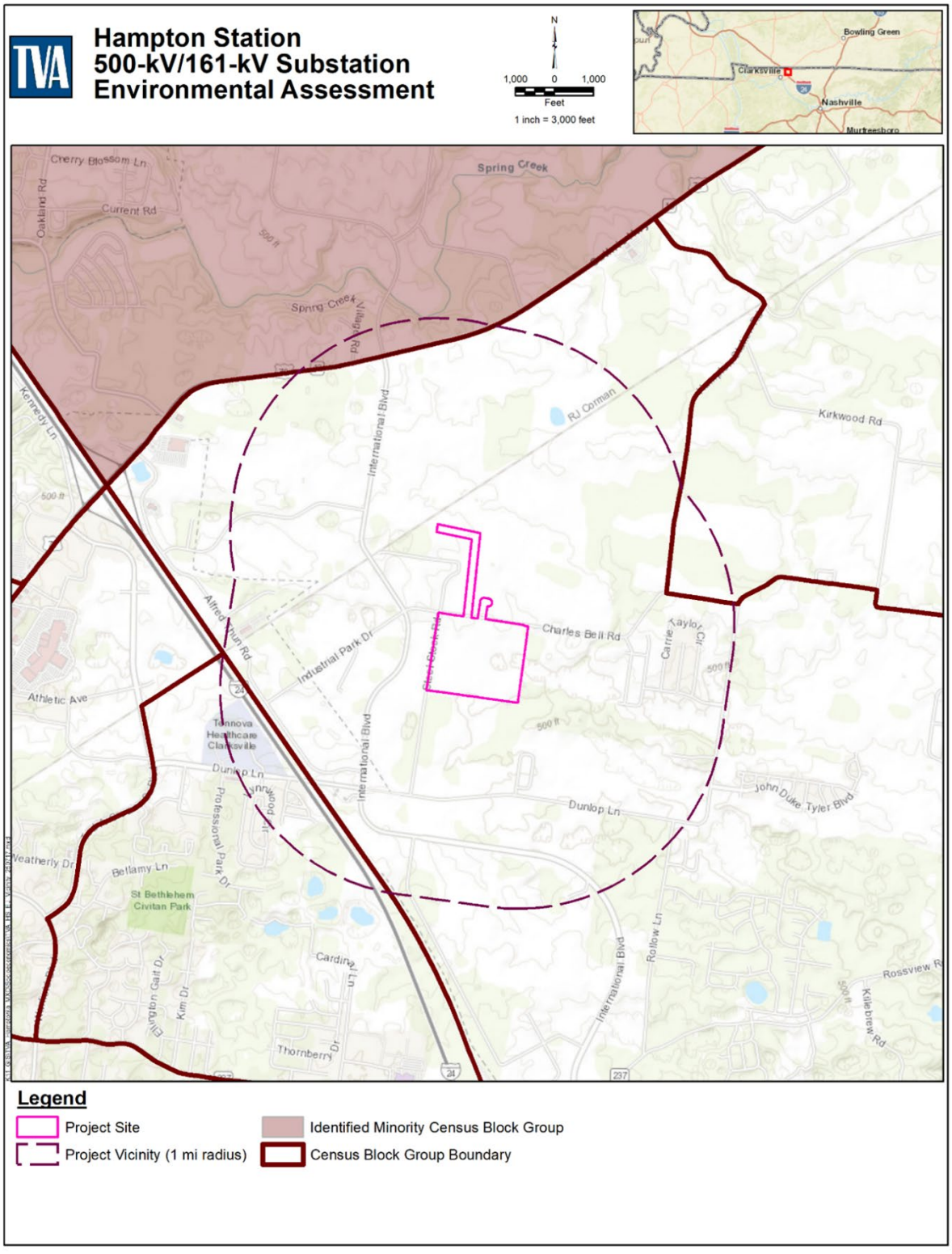

Figure 3-7. Minority Census Block Groups Identified Within the 1-Mile Study Area

The nationwide poverty level is determined annually by the USCB and varies by the size of family and number of related children under 18 years of age. The 2024 USCB poverty threshold for an individual under the age of 65 is an annual income of $16,320, and for a family of four it is an annual household income of $32,355 (USCB 2024b). The per capita income in the study area ranges from $31,041 to $56,800, which is notably higher than that of Montgomery County ($33,645) and the state of Tennessee ($37,866) (Table 3-17). In contrast, the percentage of the block group population falling below the poverty level (approximately 11 percent) is similar to both the county and the state (approximately 12 percent and 14 percent, respectively).

For the purposes of this assessment, low-income individuals are those whose annual household income is less than two times the poverty level. The percentage of the population of Tennessee living below the low-income threshold is 32.1 percent, while Montgomery County has a percentage of 29.5 percent. Approximately 21 percent of people living within the study area CBGs are considered low-income, with percentages for individual CBGs ranging from 10 percent to 30 percent of the population. The effects of income on baseline health and other aspects of susceptibility are not limited to those below the poverty thresholds. For example, populations having an income level from one to two times the poverty level also have worse health overall than those with higher incomes (Centers for Disease Control and Prevention 2013). None of the CBGs have low-income populations that either exceed 50 percent of the total population or significantly exceed the low-income percentage of the general population, including the block groups in which the primary project activities would occur.

The civilian labor force within the study area is 7,199, with the unemployment rate at 3.9 percent. This unemployment rate is slightly lower than the unemployment rate of Montgomery County and the state of Tennessee (5.5 percent and 4.7 percent, respectively) (USCB 2024a). See Table 3-17.

3.12.1.2. Community Facilities and Services

Community facilities and services include public or publicly funded facilities such as police protection and other emergency services (ambulance/fire protection), schools, hospitals and other health care facilities, libraries, daycare centers, churches, and community centers. To identify facilities and emergency services that could be potentially impacted by the project, the study area is identified as the service area of various providers, where applicable, or the area within a 5-mile radius of the project.

Based on a review of aerial imagery and online information, including the USGS Geographic Names Information System database (USGS 2021), community facilities and services available within a 5-mile radius of the project include numerous churches, four schools, two post offices, and one medical clinic. The Clarksville Fire Department Stations 8 and 9 and the Montgomery County Emergency Medical Services Station 22 also serve the study area.

3.12.2. Environmental Consequences

3.12.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the project or make associated modifications to the existing transmission system. Therefore, there would be no change in local demographics, socioeconomic conditions, or community services, and there would be no impacts to minority and low-income populations in association with the project.

3.12.2.2. Alternative B – Action Alternative

3.12.2.2.1. Demographic and Economic Impacts

Construction activities would be phased and occur over approximately 45 months and would entail the use of mobile crews of contractors and full-time TVA staff. The construction workforce would total between 10 and 63 workers at a given time, and it is anticipated that most of these workers would be drawn from the labor force that currently resides in the region; however, some specialty workers and laborers not available within the area may be needed to support construction activities. Following construction, work crews would be present in the study area for occasional operation and maintenance activities. Given the relatively small workforce and that most workers needed would likely be drawn from the existing labor force, impacts to demographics and local employment would be minor.

Potential economic impacts associated with the project relate to direct and indirect effects of property acquisition, construction, and operations. TVA would acquire the 107-acre substation parcel as well as easements on two off-site parcels for two 200-foot-wide rights-of-way (ROWs) for the 0.8-mile transmission line (14.2 acres) and the 0.5-mile transmission line (3.3 acres). Additionally, one residential property would be displaced as a result of land acquisition. Acquisition would give TVA the right to construct, operate, and maintain the project across the properties. In each case, landowners would be compensated for the value of such rights or properties. Given the relatively minor acquisitions, the direct local economic effect from the purchase of additional property or ROW acquisitions would be minor relative to the total regional economy. Construction and maintenance activities would also result in minor but beneficial impacts to the local economy through the purchases of materials and supplies, potential procurement of contract workers or additional services, and expenditure of the wages earned by the transient workforce in the local communities.

There is also the potential for a decrease in property value for those parcels with views of the proposed new transmission lines and substation/switchyard. However, most of the project features would be located in areas with existing commercial/industrial and transmission infrastructure; residential properties have been avoided to the greatest extent possible. Most residences are a considerable distance from the proposed substation and transmission line ROWs. However, the nearest residence is located adjacent to the 107-acre substation parcel's eastern boundary and is currently separated by a vegetated buffer of tall trees. Because the substation and switchyard boundary would be located farther west from the nearby residences (approximately 250 feet), effects to local property values would be minor.

3.12.2.2.2. Community Facilities and Services

Direct impacts to community facilities occur when a community facility is displaced or access to the facility is altered. Neither the construction or operation of the proposed project would result in the displacement of community facilities or impede access to any facilities. Therefore, there would be no impact to community facilities as a result of the project.

Indirect impacts occur when a proposed action or project results in a population increase that would generate greater demands for services or affect the delivery of such services. Project construction and maintenance would not result in notable impacts to local demographics, and increased demands for services such as schools, churches, and healthcare facilities are not anticipated. In the event of an emergency at the proposed

substation or transmission lines, local law enforcement, fire, or emergency medical service response would likely be required. An emergency would be a rare occurrence and adequate emergency services are available and would be able to access the project facilities. Therefore, the project would not have a notable impact on the demand for emergency services in the area.

3.13. Transportation

3.13.1. Affected Environment

The primary transportation infrastructure in the vicinity of the project consists of a network of local roadways and state highways that feed into I-24, an interstate highway that provides a connection to Nashville, Tennessee to the southeast and Kentucky to the northwest. Primary access from I-40 to the 107-acre substation parcel and transmission line ROWs (project area) is provided by U. S. 79/SR 13 that runs northeast of the project area. Access to the project area from U. S. 79 is provided from a local roadway, International Boulevard. U. S. 79 extends northeast from I-40 to the Tennessee–Kentucky state line. Southwest of I-24, U. S. 79 connects to the City of Clarksville.

Table 3-18 presents the 2024 Average Annual Daily Traffic (AADT) measured in vehicles per day and functional roadway classification for the routes servicing the project area. Roadway functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide and is dependent on factors related to access and mobility, roadway characteristics (number of lanes, shoulders), and setting (rural versus urban). The road network in the vicinity of the project is currently urban/suburban in nature and the intersections are generally unsignalized. North of I-24, traffic on U. S. 79 is primarily generated by users accessing a small number of rural residences, scattered businesses, agricultural operations. Traffic on U. S. 79 also may be traveling to the State of Kentucky that provides connections to SR 11 and U. S. 41.

Table 3-18. AADT and Functional Classification of Roadways in Proximity to the Proposed Project Located in Montgomery County, Tennessee

Roadway Segment	Setting	Functional Classification[a]	AADT (vehicles/day)[b]	Number of Lanes
I-24	Urban	Interstate	62,499	4
U. S. Highway 79	Urban	Urban Minor Arterial	9,288	2-4
International Boulevard / County Route 6057	Urban	Urban Minor Arterial	6,303	4

[a] Tennessee Department of Transportation (TDOT) 2024
[b] TDOT 2025
AADT = Average Annual Daily Traffic

I-24 is a divided, four-lane, limited access interstate highway located approximately 1 mile southwest of the project. I-24 is generally oriented northwest–southeast and provides a connection to Nashville, as well as Pleasant View, Tennessee. While a small percentage of project-related traffic could come from local roads to the north, it is assumed that vehicles would typically access the project area from I-24.

U. S. 79 is a northeast–southwest free-flow arterial collector roadway connecting to I-24 at Exit 4. Northeast of I-24, U. S. 79 is a four-lane divided highway for approximately 1.45 miles. At the intersection of U. S. 79 and International Boulevard, U. S. 79 is reduced down to two lanes continuing northeast toward the state line. Several low-volume local roads feed into U. S. 79 in the vicinity of the project, including Industrial Park Access Road, Oakland Road, International Boulevard/Boolean Drive, Jim Johnson Road, and Hampton Station Road. These intersections are two-way stop-controlled intersections or T-junctions, with traffic on the minor roads yielding to free-flow traffic on U. S. 79.

International Boulevard is a north–south free-flow arterial collector roadway connecting to U. S. 79. International Boulevard is primarily used for local business access. A few smaller local roads feed into International Boulevard in the vicinity of the project, including Industrial Park Road, Alfred Thun Road, and Dunlop Lane. These intersections are two-way, stop-controlled intersections or T-junctions, with traffic on the minor roads yielding to free-flow traffic on International Boulevard.

3.13.2. Environmental Consequences

3.13.2.1. Alternative A – No Action

Under the No Action Alternative, TVA would not construct the Hampton Station 500-kV/161-kV Substation or make associated modifications to the existing transmission system. Therefore, there would be no change in traffic levels or other impacts on the transportation network associated with the project.

3.13.2.2. Alternative B – Action Alternative

Reasonably foreseeable effects of the project include traffic generated by the construction of the substation, switchyard, and transmission lines. Traffic increases would consist of the construction workforce and the transport of construction equipment. Transport of spoil material and borrow material is anticipated to occur within the 107-acre substation parcel therefore, off-site hauling is not anticipated. The average workforce needed to support the construction activities proposed under this alternative ranges from 15 to 63 workers per day over the approximately 45-month phased construction period. TVA notes that there is a possibility for an overlap of workers on-site due to different stages of construction, so there is the potential for all of the approximately 63 workers to be on site at once. This workforce during peak construction would result in a traffic increase of up to 126 vehicles per day (63 vehicles entering the project area in the morning and 63 vehicles leaving the project area at the end of the workday). Construction-related vehicles, including dump trucks, concrete trucks, feller-bunchers, bulldozers, excavators, graders, pile-drivers, augers, rollers, and dozers, would be driven to the construction area or delivered on flatbed trailers, primarily during the mobilization and demobilization stages of the proposed project.

U. S. 79, located north of the project, and International Boulevard, located directly west, would provide direct roadway access. As shown in Table 3-19, the increase in traffic volume associated with project construction would increase the traffic count on International Boulevard by approximately 2 percent, U. S. 79 by approximately 1.3 percent, and would be negligible, less than 1 percent, I-24. U. S. 79 is currently operating below its capacity.

Thus, increases in daily traffic of 1.3 percent on U. S. 79 and 2 percent on International Boulevard would have a minimal impact and would not affect traffic flow. In addition, there are wide shoulders on U. S. 79 and two lanes in each direction along most of the substation boundary, allowing for traffic to pass and remain free flowing while trucks or other vehicles turn into the project area.

Table 3-19. Construction Traffic Impacts on Roadways in the Vicinity of the Proposed Project located in Montgomery County, Tennessee

Impacted Roadway Segment	Primary Project Use	2024 AADT[1]	Projected AADT[2]	% Traffic Increase	Impact Assessment
I-24	Workforce Commute, Construction Vehicle Transport	62,499	62,625	0.2%	Minor
U. S. Highway 79	Workforce Commute, Construction Vehicle Transport, Spoil and Borrow Transport	9,288	9,414	1.3%	Minor
International Boulevard /	Workforce Commute, Construction Vehicle Transport, Spoil and Borrow Transport	6,303	6,429	2.0%	Minor

[1] TDOT 2024
[2] Assumes maximum of 63 vehicles, or 126 total trips, per day.

Due to the relatively low number of construction vehicles and high capacity of the travel routes, the increase in AADT associated with project construction would not adversely affect traffic conditions on the surrounding roadway network. Transportation impacts would be localized and minor, lasting through the approximate 45-month construction period. Following construction, ongoing operations and periodic maintenance activities would generate only occasional vehicle trips that would be minimal and would not have an impact on the surrounding traffic network.

3.14. Long-term Impacts

The presence of the proposed substation, switchyard, and transmission lines would present long-term visual effects to a viewshed characterized by rural lands (forests and cultivated fields) and areas of moderate development, including commercial and residential properties, roadways, and existing utility corridors. The new LG-Chem substation would be located on property (parcel 1) adjacent and north of the substation parcel. Additionally, the Montgomery County IDB has plans for future industrial development for parcel 1.

Direct views of the proposed substation and switchyard would be limited to residents located off Charles Bell Road, adjacent to the east of the 107-acre substation parcel, and users of local roadways to the west. There are new residences located just east of the tree line, very near the 107-acre substation parcel boundary. However, the nearest residence would be approximately 250 feet from the eastern edge of the 35-acre substation/switchyard area within the parcel and approximately 150 feet from the 0.5-mile transmission line and 250 feet from the 0.8-mile transmission line. The existing vegetative buffer of tall trees would block unimpeded views of the proposed facilities.

The provision of load demands for two customers, Google and LG Chem, as well as the additional capacity and reliability benefits for the Clarksville and Hopkinsville regions over time could make these areas more attractive to additional commercial and residential development. However, the extent and degree of such development depends on a variety of factors and cannot be predicted accurately. Residential and commercial growth of this area would be a minor and long-term consequence of the reliability benefits that the proposed substation, switchyard, and transmission lines would bring.

3.14.1. Postconstruction Effects

3.14.1.1. Electric and Magnetic Fields

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

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

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

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

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

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

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

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

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

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

TVA follows medical and health research related to EMFs, along with media coverage and reports that may not have been peer reviewed by scientists or medical personnel. No controlled laboratory research has demonstrated a cause-and-effect relationship between low-frequency electric or magnetic fields and health effects or adverse health effects even when using field strengths many times higher than those generated by power transmission lines. Statistical studies of overall populations and increased use of low-frequency electric power have found no associations (WHO 2007b).

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

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

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

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

3.14.1.2. Lightning Strike Hazard

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

3.14.1.3. Transmission Structure Stability

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

Self-supporting, galvanized, laced-steel structures, and steel, single-pole and H-frame structures similar to those shown in Figures 2-1 and 2-2 would be used for the proposed 500-kV and 161-kV transmission lines. These structures have demonstrated a good safety record. They are not prone to rot or crack like wooden poles, nor are they subject to substantial storm damage due to their low cross-section in the wind.

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

3.15. Unavoidable Adverse Environmental Impacts

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

- Clearing associated with construction of the proposed transmission line could result in a small amount of localized siltation.
- Trees would not be permitted to grow within the ROW or to a determined height adjacent to the ROW that would endanger the transmission line. In areas where the ROW would traverse forested areas, this would cause a change in the visual character of the immediate area and would segment some forested areas.
- Clearing and construction would result in the disruption and/or loss of some plant and wildlife, and the permanent loss of 0.75 acres of forested habitat.
- A small 0.08-acre pond and associated 0.31-acre scrub-shrub fringe wetland would be filled.
- Any burning of cleared material would result in some short-term air pollution.
- The proposed substation, switchyard, and transmission lines would result in minor, long-term visual effects on the landscape in the immediate local area.

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

Land within the ROW of the proposed transmission lines would be committed to use for electrical system needs for the foreseeable future (Figure 1-2). Periodic clearing of the ROW would preclude forest and agricultural management within the ROW for the operational life of the transmission line. These losses of long-term productivity with respect to timber production or farmland and as wildlife habitat are minor both locally and regionally.

3.17. Irreversible and Irretrievable Commitments of Resources

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

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

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

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CHAPTER 4 – LIST OF PREPARERS

4.1. NEPA Project Management

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Appendix A – Coordination & Consultation Correspondence

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Sent:	Monday, November 18, 2024 9:57 AM
To:	Beliles, Emily
Cc:	Cole, Steve C; Babin, Mark Holden
Subject:	Montgomery-Hemlock No. 1 161 kV Tap to LG Chemical, CRMS 98808141222 - Project # SHPO0005998

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

2024-11-18 08:55:49 CST

Dr. Steve Cole
Tennessee Valley Authority

RE: Tennessee Valley Authority (TVA), Montgomery-Hemlock No. 1 161 kV Tap to LG Chemical, CRMS 98808141222, Project#: SHPO0005998, Montgomery County, TN

Dear Dr. Steve Cole:

In response to your request, we have reviewed the cultural resources survey report and accompanying documentation submitted by you regarding the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Considering the information provided, we concur that no historic properties eligible for listing in the National Register of Historic Places will be affected by this undertaking. If project plans are changed or archaeological remains are discovered during project construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. Please provide your Project # when submitting any additional information

regarding this undertaking. Questions or comments may be directed to Casey Lee, who drafted this response, at Casey.Lee@tn.gov, +16152533163.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

Ref:MSG16287432_V6c9lMbNZbggFvde0yA

2

Babin, Mark Holden

From:	TN Help <tnhelp@service-now.com>
Sent:	Friday, March 28, 2025 2:49 PM
To:	Beliles, Emily
Cc:	Cole, Steve C; Babin, Mark Holden
Subject:	Hampton Station Substation Project; CRMS 113341388475 - Project # SHPO0006685

TENNESSEE HISTORICAL COMMISSION
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2025-03-28 13:47:17 CDT

Dr. Steve Cole
Tennessee Valley Authority

RE: Tennessee Valley Authority (TVA), Hampton Station Substation Project; CRMS 113341388475, Project#: SHPO0006685, Montgomery County, TN

Dear Dr. Steve Cole:

Pursuant to your request, this office has reviewed documentation concerning the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

We wanted to commend the authors for an exceptional evaluation of the Memphis, Clarksville, and Louisville Railroad. Our office agrees that the segment of the Railroad in the report is eligible under Criterion A. We further concur that it will not be adversely affected by the undertaking. Finally, we concur that no archaeological resources will be affected by this undertaking.

If project plans are changed or previously unevaluated archaeological resources are discovered during project construction, please contact this office to determine what further action, if any, will be

necessary to comply with Section 106 of the National Historic Preservation Act. Include the Project # if you need to submit any additional information regarding this undertaking. Questions and comments may be directed to Casey Lee, who drafted this response, at Casey.Lee@tn.gov, +16152533163. We appreciate your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

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Appendix B – U. S. District Court for the Eastern District of Tennessee, Sherwood v. TVA, No. 3:12-CV-156-TAV-HBG

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UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TENNESSEE

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

INJUNCTION ORDER

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

IT IS SO ORDERED.

s/ Thomas A. Varlan
CHIEF UNITED STATES DISTRICT JUDGE

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

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

1.0 Overview

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

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

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

2.0 Right-of-Way Management Methods

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

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

Rev (9) Feb. 2022

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

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

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

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

3.0 Herbicide Program

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

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

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

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

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

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

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

Rev (9) Feb. 2022

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

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

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

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

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

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

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

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

4.0 Benefits

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

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

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

Rev (9) Feb. 2022

5.0 References

Integrated Vegetation Management (IVM) on Rights-of-Way Fact Sheet. (2012, May) Retrieved from http://www.epa.gov/pestwise/htmlpublications/row_fact_sheet.html

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

U.S. Forest Service. 1989a. Vegetation Management in the Coastal Plain/Piedmont Final Environmental Impact Statement, Volumes I and II. Southern Region Management Bulletin R8-MB-23, January 1989. Atlanta, Ga.: USDA Forest Service.

———. 1989b. Vegetation Management in the Appalachian Mountains Final Environmental Impact Statement, Volumes I and II. Southern Region Management Bulletin R8-MB-38, July 1989. Atlanta, Ga.: USDA Forest Service.

———. 2002a. Vegetation Management in the Appalachian Mountains Final Environmental Impact Statement Supplement. Southern Region Management Bulletin R8-MB-97A, October 2002. Atlanta, Ga.: USDA Forest Service.

———. 2002b. Vegetation Management in the Coastal Plain/Piedmont Final Environmental Impact Statement Supplement. Southern Region Management Bulletin R8-MB-98A, October 2002. Atlanta, Ga.: USDA Forest Service.

Appendix D – Categorical Exclusion Checklist (CEC) 52299

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Categorical Exclusion Record for Proposed TVA Actions

Categorical Exclusion Number Claimed	Organization ID Number	**Tracking Number** *(NEPA Administration Use Only)*
13	Project: 546496 - Work Order: 2S15F	52299

Form Preparer	Project Initiator/Manager	Business Unit
Jessica Lyon	Shane K Beasley	ED - Electric System Projects

Project Title	Hydrologic Unit Code
Hampton Station, TN 500-kV Substation - Geotechnical Studies. Project: 546496 - Work Order: 2S15F	

Description of Proposed Action *(Include Anticipated Dates of Implementation)* ☐ Continued on Page 3 *(if more than one line)*

For Proposed Action See Attachments and References

Initiating TVA Facility or Office	TVA Business Units Involved in Project
Transmission	

Location *(City, County, State)*

Montgomery, TN, Intersection of Steel Stock Rd and Charles Bell Rd in Clarksville, TN

Parts 1 through 4 verify that there are no extraordinary circumstances associated with this action:

Part 1. Project Characteristics

	Is there evidence that the proposed action...	No	Yes	Commit-ment	Information Source for Insignificance
	1.Is major in scope?	X			Lyon, Jessica 09/18/2024
	2.Is part of a larger project proposal involving other TVA actions or other federal agencies?		X		For comments see attachments
*	3.Involves non-routine mitigation to avoid adverse impacts ?	X			Lyon, Jessica 09/18/2024
	4.Is opposed by another federal, state, or local government agency?	X			Lyon, Jessica 09/18/2024
*	5.Has environmental effects which are controversial?	X			Lyon, Jessica 09/18/2024
*	6.Is one of many actions that will affect the same resources?	X			Lyon, Jessica 09/18/2024
	7.Involves more than minor amount of land?	X			Lyon, Jessica 09/18/2024

*If "yes" is marked for any of the above boxes, consult with NEPA Administration on the suitability of this project for a categorical exclusion.

Part 2. Natural and Cultural Features Affected

Would the proposed action...	No	Yes	Permit	Commit-ment	Information Source for Insignificance
1.Potentially affect endangered, threatened, or special status species?	X		No	No	For comments see attachments
2.Potentially affect historic structures, historic sites, Native American religious or cultural properties, or archaeological sites?		X	No	No	For comments see attachments
3.Potentially take prime or unique farmland out of production?	X		No	No	Lyon, Jessica 09/18/2024
4.Potentially affect Wild and Scenic Rivers or their tributaries?	X		No	No	Lyon, Jessica 09/18/2024
5.Potentially affect a stream on the Nationwide Rivers Inventory?	X		No	No	Lyon, Jessica 09/18/2024
6.Potentially affect wetlands?		X	No	No	For comments see attachments
7.Potentially affect water flow, stream banks or stream channels?	X		No	No	Lyon, Jessica 09/18/2024
8.Potentially affect the 100-year floodplain?	X		No	No	Lyon, Jessica 09/18/2024
9.Potentially affect ecologically critical areas, federal, state, or local park lands, national or state forests, wilderness areas, scenic areas, wildlife management areas, recreational areas, greenways, or trails?	X		No	No	Lyon, Jessica 09/18/2024
10.Contribute to the spread of exotic or invasive species?	X		No	No	For comments see attachments
11.Potentially affect migratory bird populations?	X		No	No	Mitchell, David 05/02/2024
12.Involve water withdrawal of a magnitude that may affect aquatic life or involve interbasin transfer of water?	X		No	No	Lyon, Jessica 09/18/2024
13.Potentially affect surface water?	X		No	No	For comments see attachments
14.Potentially affect drinking water supply?	X		No	No	Lyon, Jessica 09/18/2024
15.Potentially affect groundwater?	X		No	No	For comments see attachments
16.Potentially affect unique or important terrestrial habitat?	X		No	No	For comments see attachments
17.Potentially affect unique or important aquatic habitat?	X		No	No	Lyon, Jessica 09/18/2024

Part 3. Potential Pollutant Generation

Would the proposed action potentially (including accidental or unplanned)...	No	Yes	Permit	Commit-ment	Information Source for Insignificance
1.Release air pollutants?	X		No	No	Lyon, Jessica 09/18/2024
2.Generate water pollutants?		X	No	No	For comments see attachments
3.Generate wastewater streams?	X		No	No	Lyon, Jessica 09/18/2024
4.Cause soil erosion?		X	No	No	For comments see attachments
5.Discharge dredged or fill materials?	X		No	No	Lyon, Jessica 09/18/2024
6.Generate large amounts of solid waste or waste not ordinarily generated?	X		No	No	Lyon, Jessica 09/18/2024
7.Generate or release hazardous waste (RCRA)?	X		No	No	Lyon, Jessica 09/18/2024
8.Generate or release universal or special waste, or used oil?	X		No	No	Lyon, Jessica 09/18/2024
9.Generate or release toxic substances (CERCLA, TSCA)?	X		No	No	Lyon, Jessica 09/18/2024
10.Involve materials such as PCBs, solvents, asbestos, sandblasting material, mercury, lead, or paints?	X		No	No	Lyon, Jessica 09/18/2024
11.Involve disturbance of pre-existing contamination?	X		No	No	Lyon, Jessica 09/18/2024
12.Generate noise levels with off-site impacts?	X		No	No	Lyon, Jessica 09/18/2024
13.Generate odor with off-site impacts?	X		No	No	Lyon, Jessica 09/18/2024
14.Produce light which causes disturbance?	X		No	No	Lyon, Jessica 09/18/2024
15.Release of radioactive materials?	X		No	No	Lyon, Jessica 09/18/2024
16.Involve underground or above-ground storage tanks or bulk storage?	X		No	No	Lyon, Jessica 09/18/2024
17.Involve materials that require special handling?	X		No	No	Lyon, Jessica 09/18/2024

Part 4. Social and Economic Effects

Would the proposed action...	No	Yes	Permit	Commit-ment	Information Source for Insignificance
1.Potentially cause public health effects?	X			No	Lyon, Jessica 09/18/2024
2.Increase the potential for accidents affecting the public?	X			No	Lyon, Jessica 09/18/2024
3.Cause the displacement or relocation of businesses, residences, cemeteries, or farms?	X			No	Lyon, Jessica 09/18/2024
4.Contrast with existing land use, or potentially affect resources described as unique or significant in a federal, state, or local plan?	X			No	Lyon, Jessica 09/18/2024
5.Disproportionately affect minority or low-income populations?	X			No	Lyon, Jessica 09/18/2024
6.Involve genetically engineered organisms or materials?	X			No	Lyon, Jessica 09/18/2024
7.Produce visual contrast or visual discord?	X			No	Lyon, Jessica 09/18/2024
8.Potentially interfere with recreational or educational uses?	X			No	Lyon, Jessica 09/18/2024
9.Potentially interfere with river or other navigation?	X		No	No	Lyon, Jessica 09/18/2024
10.Potentially generate highway or railroad traffic problems?	X			No	Lyon, Jessica 09/18/2024

Part 5. Other Environmental Compliance/Reporting Issues

Would the proposed action...	No	Yes	Commit-ment	Information Source for Insignificance
1.Release or otherwise use substances on the Toxic Release Inventory list?	X		No	Lyon, Jessica 09/18/2024
2.Involve a structure taller than 200 feet above ground level?	X		No	Lyon, Jessica 09/18/2024
3.Involve site-specific chemical traffic control?	X		No	Lyon, Jessica 09/18/2024
4.Require a site-specific emergency notification process?	X		No	Lyon, Jessica 09/18/2024
5.Cause a modification to an existing environmental permit or to existing equipment with an environmental permit or involve the installation of new equipment/systems that will require a permit?	X		No	Lyon, Jessica 09/18/2024
6.Potentially impact operation of the river system or require special water elevations or flow conditions??	X		No	Lyon, Jessica 09/18/2024
7.Involve construction or lease of a new building or demolition or renovation of existing building (i.e. major changes to lighting, HVAC, and/or structural elements of building of 1000 sq. ft. or more)?	X		No	Lyon, Jessica 09/18/2024

Based upon my review of environmental impacts, the discussion attached, and/or consultations with NEPA Administration, I have determined that the above action does not have a significant impact on the quality of the human environment and that no extraordinary circumstances exist. Therefore, this proposal qualifies for a categorical exclusion under 13 *TVA's NEPA procedures at 18 CFR part 1318 .*

Project Initiator/Manager	Date
Shane K Beasley	09/24/2024

TVA Organization	E-mail	Telephone
ED	skbeasle@tva.gov	

Environmental Concurrence Reviewer

William B Wells III 09/23/2024
Signature

Preparer Closure

Jessica Lyon 09/25/2024
Signature

Other Environmental Concurrence Signatures *(as required by your organization)*

Signature

Signature

Signature

Signature

Other Review Signatures *(as required by your organization)*

Jessica Lyon	09/23/2024		
Signature		*Signature*	
John Casey Scoggins	09/25/2024		
Signature		*Signature*	
Signature		*Signature*	

Attachments/References

Description of Proposed Action Continued from Page 1
TPS plans to perform soil borings at the location of the proposed Hampton Station, TN 500-kV substation. The station will be located at the intersection of Steel Stock Road and Charles Bell Road and immediately southeast of the existing TVA Montgomery, TN500-kV substation. The parcel requiring survey is approximately 108 acres and is currently an agricultural field. No tree clearing or vegetation removal is anticipated. See attachments for the bore map and soil boring coordinates.

CEC General Comment Listing

1.	Plans and Map			
	By: Lauren Lyons		04/02/2024	
	Files:	Copy of Soil Boring Coordinates.xlsx	04/02/2024	13.83 Bytes
		AERIAL.pdf	04/02/2024	1,675.00 Bytes
		CP-986s1 (1).pdf	04/02/2024	2,104.06 Bytes
		SK-2829-R1_PRELIM.pdf	04/02/2024	319.96 Bytes
2.	The soil boring coordinates are attached.			
	By: Jessica Lyon		09/18/2024	
	Files:	HamptonStation500kVSubstation_BoringCoordinates.pdf	09/18/2024	213.57 Bytes
3.	The bore map is attached.			
	By: Jessica Lyon		09/18/2024	
	Files:	Survey Sketch.pdf	09/18/2024	217.44 Bytes
4.	TPS's Best Management Practices manual would be used for this project. Retrieved from: https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects			
	By: Jessica Lyon		09/18/2024	

CEC Comment Listing

Part 1 Comments

2.	This action is related to the proposed construction of the new TVA Hampton Station, TN 500-kV substation, which is currently the subject of an ongoing Environmental Assessment (EA).			
	By: Jessica Lyon		09/18/2024	

Part 2 Comments

1.	A May 2024 data query of the TVA Heritage database indicates no federally and two state listed plant species are known from within five miles of the proposed project. Two federally listed plant species are known from Montgomery County, Tennessee, where the project resides (Table 1). Review of maps, aerial photography, and knowledge of rare plants known from the region suggests that the proposed project area would not provide suitable habitat for listed species. Neither federal or state-listed plant species nor their habitats would be impacted by the proposed project.			
	By: David Mitchell		05/02/2024	
	Files:	Hamptonboring_botany_table.docx	05/02/2024	15.29 Bytes
2.	TVA contracted with TerraXplorations (TerraX) to conduct a Phase I archaeological survey of the APE. A detailed discussion of the survey and results are provided in the associated report, titled A Phase I Archaeological Survey for Tennessee Valley Authority's Proposed Hampton Station Boring Project, Montgomery County, Tennessee, which is located in the project CRMS folder. As a result of the investigations, TerraX revisited two previously recorded archaeological sites (40MT134 and 40MT135) and identified one isolated find (IF-1). TVA has read the report and agrees with TerraXs recommendations. TVA finds that the project would have no adverse effect to historic properties.			
	By: Mark H Babin		09/23/2024	
	Files:	TVA_Section106_HamptonStationSoilBoring_MontgomeryCoTN_SHPO_CRMS93555298603_20AUG2024.pdf	09/23/2024	116.92 Bytes
		TN SHPO Comments and Concurrence 8.21.2024.pdf	09/23/2024	579.26 Bytes
10.	The proposed project would not significantly contribute to the spread of exotic or invasive species because ground disturbance associated with the project would be minimal and the project area doesn't contain a sizable proportion of non-native, invasive species. The project would not contribute to the spread of exotic or invasive species.			

By: David Mitchell 05/02/2024

13. Proper implementation of standard TPS Best Management Practices (TVA, 2022), retrieved from (https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects), and standard commitments to contain/dispose all waste and to prevent pollution runoff and discharge would result in insignificant surface water impacts.
By: Jessica Lyon 09/18/2024

15. Insignificant groundwater impacts will result from proper implementation of standard TPS Best Management Practices (TVA, 2022), retrieved from (https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects), to contain/dispose all waste and to prevent pollution runoff and discharge.
By: Jessica Lyon 09/18/2024

16. No uncommon plant communities are known from the vicinity of the project area and no rare plant communities were evident in aerial photography. Implementation of the proposed project would not affect unique or important terrestrial habitat.

By: David Mitchell 05/02/2024

6. One wetland delineated. Avoid. NI located here: Z:\BCC\FY2024\TPS\44497_HamptonStationSoilBoring_546496\NEPA_Input
By: Zachary D Buecker 05/29/2024

Files:	44497_Wetlands_NI_Hampton Station Stage 2 Soil Borings.docx	05/29/2024	20.94 Bytes
	Wetlands_USACE_44497_Hampton Station Stage 2 Soil Borings.pdf	05/29/2024	826.83 Bytes
	Wetlands_TRAM_44497_Hampton Station Stage 2 Soil Borings.pdf	05/29/2024	821.83 Bytes
	Wetlands_Photolog_44497_Hampton Station Stage 2 Soil Borings.pdf	05/29/2024	2,137.59 Bytes

Part 3 Comments

2. Insignificant surface water impacts would result with proper implementation of standard Best Management Practices (TVA, 2022), retrieved from (https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects), and proper containment/treatment/disposal of wastewaters, stormwater runoff, waste and potential pollutants.
By: Jessica Lyon 09/18/2024

4. Any remaining soil/Geotech material that is not taken to the lab will be backfilled or spread onsite adjacent to the borehole, if possible, and stabilized with BMPs. If material cannot be backfilled or spread adjacent to bore locations, please contact site environmental support to determine a suitable location for the material.
By: Jessica Lyon 09/18/2024

CEC Permit Listing

CEC Commitment Listing

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Appendix E – Migratory Birds – Habitat Preferences

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Species	Seasonal presence	Description & Habitat Availability
Black-billed cuckoo	Summer resident	Typically found in dense, mature woodlots and thickets. They feed on a variety of caterpillars, worms, insects, berries, and seeds. Will generally construct nests in leaves and branches of trees close to, but not on the ground (National Geographic, 2002). Suitable habitat for this species is not present in the project area.
Bobolink	Summer resident	Typically found in open fields or meadows with tall grasses and freshwater marsh habitats. Generally feed on seeds, insects, arachnids, and other small invertebrates. Typically nests on the ground among non-woody vegetation (National Geographic, 2002). The majority of the project area is agricultural field, but some areas could support bobolink nesting.
Cerulean warbler	Summer resident	Found in large, unbroken woodlots with white oak or sugar maples present. Stays high in the tree canopy where they build their nests and feeds primarily on flies, beetles, and other small insects. Forested segments large enough to facilitate this species are not present in the project action area.
Chimney swift	Summer resident	Generally forages over open field and along treelines. Typically feeds on flies, bees, and other flying invertebrates. Nests in trees, caves, and chimneys. Suitable nesting habitat was not observed in the project area.
Field sparrow	Permanent resident	Frequent old fields, fencerows, hedgerows, and early successional habitats where perches are present. Typically feeds on small seeds and a variety of small insects. Often nest on or near the ground in clumps of grasses in early successional or shrub habitat. Areas of early successional habitat are scattered throughout the project area along a forested edge that may provide suitable foraging and nesting habitat for this species.
Grasshopper sparrow	Summer resident	Found in open areas, grassy fields, and meadows. Their primary prey is grasshoppers but will also predate on a variety of other small invertebrates and seeds. Typically nests on the ground in clumps of tall grasses (National Geographic, 2002). Potential nesting habitat for this species is present in the project area.

Species	Seasonal presence	Description & Habitat Availability
Kentucky warbler	Summer resident	Found within large, dense tracts of forest with plentiful understory cover. They feed on a variety of invertebrates including spiders, beetles, and caterpillars. Nests on the forest floor, typically among ferns or dense, leafy vegetation (National Geographic, 2002). Unbroken habitat vast enough to facilitate nesting is not present in the project area.
Lesser yellowlegs	Migratory vagrant	Usually found in wet areas, wetlands, marshes, and shorelines. Feeds on terrestrial and aquatic invertebrates. Suitable habitat for this species is not present in the project area.
Prairie warbler	Summer resident	Typically found in overgrown or shrubby fields interspersed with fragmented tree growth. This species feeds on small insects and spiders. Potentially suitable foraging and nesting habitat for prairie warbler is present in the project area among grassy forested edges.
Prothonotary warbler	Summer resident	Prefer large tracts of moist woodlots such as bottomland hardwoods, forested wetlands, or forests near streams, rivers, and lakes. Predates on a variety of invertebrates such as grasshoppers, flies, spiders, snails, and caterpillars (National Geographic, 2002). One pond is present in the project area; however, the forested habitat in the vicinity is not large enough to support nesting for this species.
Red-headed woodpecker	Permanent resident	Found in a variety of habitats including dense woodlots, open fields with scattered dead or dying trees, swamps, and residential areas. Feed on a variety of insects and seeds (National Geographic, 2002). Potentially suitable foraging habitat is present in the project area. No tree cavities observed in the project action area that would support red-headed woodpecker nesting.
Rusty blackbird	Winter resident	Found in moist woodlots and wetlands. Typically feeds on insects, seeds, and fruits. Does not breed in project region (National Geographic, 2002). Foraging habitat present in vegetation near small pond.
Semipalmated sandpiper	Migratory vagrant	Usually found near shorelines or marshes. Predates on insects and small aquatic invertebrates. Migrates through the project region. Suitable habitat not present in project area.
Wood thrush	Summer resident	Found on or near the ground in unbroken woodlots. Usually feeds on insects and small berries and fruits. Suitable nesting habitat not present in project area.

Appendix F – TVA Bat Strategy Project Review Form

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Project Review Form - TVA Bat Strategy *(04/2025)*

*This form should **only** be completed if project includes activities in Tables 2 or 3 (STEP 2 below). This form is not required if project activities are limited to Table 1 (STEP 2) or otherwise determined to have no effect on federally listed bats. If so, include the following statement in your environmental compliance document (e.g., add as a comment in the project CEC): "Project activities limited to Bat Strategy Table 1 or otherwise determined to have no effect on federally listed bats. Bat Strategy Project Review Form NOT required." This form is to assist in determining required conservation measures per TVA's ESA Section 7 programmatic consultation for routine actions and federally listed bats.*[1]

Project Name: Hampton Station, TN 500-kV Substation **Date:** Sept 9, 2024

Contact(s): Jessica Lyon **CEC#:** **Project ID:** 546495

Project Location (City, County, State): Montgomery County, TN

Project Description:

TVA proposes to acquire a ~107-acre parcel and construct a new Hampton Station, TN 500kV substation. Additionally, TVA will be constructing the ultimate TL arrangement: (1) two 0.8-mile-long double-circuit loop lines and (2) a new 0.5-mile-long double-circuit TL on 100-ft-wide ROW from the proposed Hampton Station substation to the customer's, LG Chem, 161kV substation.

SECTION 1: PROJECT INFORMATION - ACTION AND ACTIVITIES

STEP 1) Select TVA Action. If none are applicable, contact environmental support staff, Environmental Project Lead, or Terrestrial Zoologist to discuss whether form (i.e., application of Bat Programmatic Consultation) is appropriate for project:

1 Manage Biological Resources for Biodiversity and Public Use on TVA Reservoir Lands	6 Maintain Existing Electric Transmission Assets
2 Protect Cultural Resources on TVA-Retained Land	7 Convey Property associated with Electric Transmission
3 Manage Land Use and Disposal of TVA-Retained Land	■ 8 Expand or Construct New Electric Transmission Assets
4 Manage Permitting under Section 26a of the TVA Act	9 Promote Economic Development
5 Operate, Maintain, Retire, Expand, Construct Power Plants	10 Promote Mid-Scale Solar Generation

STEP 2) Select all activities from Tables 1, 2, and 3 below that are included in the proposed project.

TABLE 1. Activities with no effect to bats. Conservation measures & completion of bat strategy project review form NOT required.

☐ 1. Loans and/or grant awards	☐ 8. Sale of TVA property	☐ 19. Site-specific enhancements in streams and reservoirs for aquatic animals
☒ 2. Purchase of property	☐ 9. Lease of TVA property	☐ 20. Nesting platforms
☐ 3. Purchase of equipment for industrial facilities	☐ 10. Deed modification associated with TVA rights or TVA property	☐ 41. Minor water-based structures (this does not include boat docks, boat slips or piers)
☐ 4. Environmental education	☐ 11. Abandonment of TVA retained rights	☐ 42. Internal renovation or internal expansion of an existing facility
☐ 5. Transfer of ROW easement and/or ROW equipment	☐ 12. Sufferance agreement	☐ 43. Replacement or removal of TL poles
☐ 6. Property and/or equipment transfer	☐ 13. Engineering or environmental planning or studies	☒ 44. Conductor and overhead ground wire installation and replacement
☐ 7. Easement on TVA property	☐ 14. Harbor limits delineation	☐ 49. Non-navigable houseboats

Project Review Form - TVA Bat Strategy *(04/2025)*

TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Conservation measures and completion of bat strategy project review form REQUIRED; review of bat records in proximity to project NOT required.		
☑ 18. Erosion control, minor	☐ 57. Water intake - non-industrial	☐ 79. Swimming pools/associated equipment
☐ 24. Tree planting	☐ 58. Wastewater outfalls	☐ 81. Water intakes – industrial
☐ 30. Dredging and excavation; recessed harbor areas	☐ 59. Marine fueling facilities	☐ 84. On-site/off-site public utility relocation or construction or extension
☐ 39. Berm development	☐ 60. Commercial water-use facilities (e.g., marinas)	☐ 85. Playground equipment - land-based
☐ 40. Closed loop heat exchangers (heat pumps)	☐ 61. Septic fields	☐ 87. Aboveground storage tanks
☐ 45. Stream monitoring equipment - placement and use	☐ 66. Private, residential docks, piers, boathouses	☐ 88. Underground storage tanks
☐ 46. Floating boat slips within approved harbor limits	☐ 67. Siting of temporary office trailers	☐ 90. Pond closure
☐ 48. Laydown areas	☐ 68. Financing for speculative building construction	☐ 93. Standard License
☐ 50. Minor land based structures	☐ 72. Ferry landings/service operations	☐ 94. Special Use License
☐ 51. Signage installation	☐ 74. Recreational vehicle campsites	☐ 95. Recreation License
☐ 53. Mooring buoys or posts	☐ 75. Utility lines/light poles	☐ 96. Land Use Permit
☐ 56. Culverts	☐ 76. Concrete sidewalks	

Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eMap reviewer or Terrestrial Zoologist.		
☑ 15. Windshield and ground surveys for archaeological resources	☑ 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter	☐ 69. Renovation of existing structures
☐ 16. Drilling	☐ 35. Stabilization (major erosion control)	☐ 70. Lock maintenance/ construction
☐ 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles)	☐ 36. Grading	☐ 71. Concrete dam modification
☐ 21. Herbicide use	☐ 37. Installation of soil improvements	☐ 73. Boat launching ramps
☐ 22. Grubbing	☐ 38. Drain installations for ponds	☐ 77. Construction or expansion of land-based buildings
☐ 23. Prescribed burns	☐ 47. Conduit installation	☐ 78. Wastewater treatment plants
☐ 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors	☐ 52. Floating buildings	☐ 80. Barge fleeting areas
☐ 26. Maintenance/construction of access control measures	☐ 54. Maintenance of water control structures (dewatering units, spillways, levees)	☐ 82. Construction of dam/weirs/ levees
☐ 27. Restoration of sites following human use and abuse	☐ 55. Solar panels	☐ 83. Submarine pipeline, directional boring operations
☐ 28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures)	☐ 62. Blasting	☐ 86. Landfill construction
☐ 29. Acquisition and use of fill/borrow material	☑ 63. Foundation installation for transmission support	☑ 89. Structure demolition
☐ 31. Stream/wetland crossings	☑ 64. Installation of steel structure, overhead bus, equipment, etc.	☐ 91. Bridge replacement
☐ 32. Clean-up following storm damage	☑ 65. Pole and/or tower installation and/or extension	☐ 92. Return of archaeological remains to former burial sites
☐ 33. Removal of hazardous trees/tree branches		

STEP 3) Project includes one or more activities in Table 3? ◉ **YES (Go to Step 4)** ○ **NO (Go to Step 12)**

Project Review Form - TVA Bat Strategy *(04/2025)*

STEP 4) Answer questions *a* through *e* below (applies to projects with activities from Table 3 ONLY)

a) Will project involve continuous noise (i.e., ≥ 24 hrs) that is greater than 75 decibels measured on the A scale (e.g., loud machinery)?
- (●) **NO** (NV2 does not apply)
- ( ) **YES** (NV2 applies, subject to records review)

b) Will project involve entry into/survey of cave?
- (●) **NO** (HP1/HP2 do not apply)
- ( ) **YES** (HP1/HP2 applies, subject to review of bat records)

c) If conducting **prescribed burning** (**activity 23**), estimated acreage: [ ] and timeframe(s) below; [■] **N/A**

STATE	Winter Hibernation	Winter Torpor	Spring Staging, Fall Swarming	Pup Season	Summer Gap	Year
VA, TN, NC	Nov 16 - Mar 31	N/A	Apr 1 - May 14, Aug 16 - Nov 15	May 15 - Jul 31	Aug 1 - Aug 15	
KY	Nov 16 - Mar 31	N/A	Apr 1 - May 14, Aug 16 - Nov 15	May 15 - Jul 31	Aug 1 - Aug 15	
AL, GA MS (Hibernation Range)*	Nov 16 - Mar 14	N/A	Mar 15 - Apr 30, Sept 1 - Nov 15	May 15 - Jul 31	Aug 1 - Aug 30	
MS (Year-round Range)*	N/A	Dec 15 - Feb 15	N/A	May 1 - Jul 15	Feb 16 - Apr 30, Jul 16 - Dec 14	

*MS (Year-round Range) = Attala, Wintson, Noxubee, Leake, Neshoba, Kemper, Rankin, Scott, and Newton Counties, Mississippi
*MS (Hibernation Range) = All MS counties in the TVA Region excluding those listed above in the Year-round Range

d) Will the project involve vegetation piling/burning?
- (●) **NO** (SSPC4/ SHF7/SHF8 do not apply)
- ( ) **YES** (SSPC4/SHF7/SHF8 applies, subject to review of bat records)

e) If **tree removal (activity 33 or 34)**, estimated amount: [0.75] (●)ac ( )trees ( )N/A

STATE	Winter Hibernation	Winter Torpor	Spring Staging, Fall Swarming	Pup Season	Summer Gap	Year
VA, TN, NC	■ Nov 16 - Mar 31	N/A	Apr 1 - May 14, Aug 16 - Nov 15	May 15 - Jul 31	Aug 1 - Aug 15	
KY	Nov 16 - Mar 31	N/A	Apr 1 - May 14, Aug 16 - Nov 15	May 15 - Jul 31	Aug 1 - Aug 15	
AL, GA MS (Hibernation Range)*	Nov 16 - Mar 14	N/A	Mar 15 - Apr 30, Sept 1 - Nov 15	May 15 - Jul 31	Aug 1 - Aug 30	
MS (Year-round Range)*	N/A	Dec 15 - Feb 15	N/A	May 1 - Jul 15	Feb 16 - Apr 30, Jul 16 - Dec 14	

*MS (Year-round Range) = Attala, Wintson, Noxubee, Leake, Neshoba, Kemper, Rankin, Scott, and Newton Counties, Mississippi
*MS (Hibernation Range) = All MS counties in the TVA Region excluding those listed above in the Year-round Range

If warranted, does project have flexibility for bat surveys (May 15-Aug 15): ( )**MAYBE** ( )**YES** (●)**NO**

**** For **PROJECT LEADS** whose projects will be reviewed by a Heritage Reviewer (Natural Resources Organization only), **STOP HERE**. Click File/ Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information. Otherwise continue to Step 5. ****

SECTION 2: REVIEW OF BAT RECORDS (applies to projects with activities from Table 3 ONLY)

STEP 5) Review of bat/cave records conducted by Heritage Reviewer? ( )**YES** ( )**NO** (Go to Step 12)

Info below completed by:
- [ ] **Heritage Reviewer** (name) [ ] Date [ ]
- [■] **Terrestrial Zoologist** (name) [Joshua Argo] Date [4/7/25]

Species	None	Within a Distance Of:	Cave/Winter Roost	Capture	Summer Roost / Roost Tree	Within the County
Gray Bat		3 mi	■		N/A	■
Indiana Bat		■ 10 mi	■			
Northern Long-Eared Bat		■ 5 mi				
Tricolored Bat		3 mi	■			■
Virginia Big-Eared Bat	■	6 mi				

Amount of SUITABLE habitat to be removed/burned (may differ from STEP 4e): [0.00] (●)ac ( )trees)* ( )N/A

Project Review Form - TVA Bat Strategy *(04/2025)*

STEP 6) Provide any additional notes resulting from Heritage Reviewer records review in Notes box below then . . . . . Go to Step 12

Notes from Bat Records Review (e.g., historic record; bats not on landscape during action; DOT bridge survey with negative results):

Unsuitable trees to be removed within NLEB swarming habitat, per July 2025 data.

STEPS 7-11 To be Completed by Terrestrial Zoologist (if warranted):

STEP 7) Project will involve removal of suitable trees within documented habitat? ○ YES ◉ NO

Hibernation Zone	Within Swarming Habitat	Near Post-WNS Captures	Near Post-WNS Summer Roosts
Indiana Bat	< 10 mi	< 5 mi	< 2.5 mi
Northern Long-Eared Bat	< 5 mi	< 1.5 mi	< 0.25 mi
Tricolored Bat	< 3 mi	< 1.5 mi	< 0.25 mi

Year-Round Zone	Near Post-WNS Captures	Near Post-WNS Summer Roost Trees
Northern Long-Eared Bat	< 1.5 mi	< 0.25 mi
Tricolored Bat	< 1.5mi	< 0.25 mi

STEP 8) Presence/absence surveys were/will be conducted: ○ YES ◉ NO ○ TBD

STEP 9) Presence/absence survey results, on ○ NEGATIVE ○ POSITIVE ◉ N/A

STEP 10) Project ○ **WILL** ◉ **WILL NOT** require use of Incidental Take in the amount of 0.00 ○ **acres or** ○ **trees** proposed to be used during the ○ **WINTER** ○ **VOLANT SEASON** ○ **NON-VOLANT SEASON** ◉ **N/A**

STEP 11) Remaining Incidental Take (prior to accounting for this project) as of

Species	Total Suitable Habitat to be Removed	Winter Season Removal	Winter Season Take Remaining*	Volant Season Removal	Volant Season Take Remaining*	Pup Season Removal	Pup Season Take Remaining*
Indiana Bat							
NLEB							
Tricolored Bat							

Take Estimates are for TVA Action 8 - Expand or Construct New Electric Transmission Assets

Amount contributed to TVA's Bat Conservation Fund upon activity completion: $ 0.00 **OR** ◉ **N/A**

TERRESTRIAL ZOOLOGISTS, after completing SECTION 2, review Table 4, modify as needed, and then complete section for Terrestrial Zoologists at end of form.

SECTION 3: REQUIRED CONSERVATION MEASURES

STEP 12) Review Conservation Measures in Table 4 and ensure those selected are relevant to the project. If not, manually override and uncheck irrelevant measures, and explain why in ADDITIONAL NOTES below Table 4.

Did review of Table 4 result in ANY remaining Conservation Measures in **RED**?

○ **NO** (Go to Step 13)

○ **YES** (STOP HERE; Submit for Terrestrial Zoology Review. Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information).

Project Review Form - TVA Bat Strategy *(04/2025)*

Manual Override

Joshua Argo

Table 4. TVA's ESA Section 7 Programmatic Bat Consultation Required Conservation Measures

The Conservation Measures in Table 4 are automatically selected based on your choices in Tables 2 and 3 but can be manually overridden, if necessary. To Manually override, press the button and enter your name.

Check if Applies to Project	Activities Subject To Conservation Measure	Conservation Measure Description
☑	15, 16, 17, 18, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96	**NV1** - Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape.
☐	16, 25, 26, 37, 47, 52, 62, 63, 64, 65, 70, 71, 73, 78, 80, 82, 83, 86, 91	**NV2** - Drilling, blasting, or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) **within a 0.5 mile radius of documented winter and/or summer roosts** (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites.
☐	16, 26, 62	**NV3** - Drilling or blasting **within a 0.5 mile radius of documented cave** (or unconventional) roosts will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the roost site.
☐	16, 26, 62	**NV4** - Drilling or blasting **within 0.5 miles of a documented roost site** (cave, tree, unconventional roost) that needs to occur when bats are present will first involve development of project-specific avoidance or minimization measures in coordination with the USFWS.
☐	15, 26, 92	**HP1** - Site-specific cases in which potential impact of human presence is heightened (e.g., conducting environmental or cultural surveys within a roost) will be closely coordinated with staff bat biologists to avoid/ minimize impacts below any potential adverse effect. Any take from these activities would be covered by TVA's Section 10 permit.
☐	15, 26, 92	**HP2** - Entry into roosts known to be occupied by federally listed bats will be communicated to the USFWS when impacts to bats may occur if not otherwise communicated (i.e., via annual monitoring reports per TVA's Section 10 permit). Any take from these activities would be covered by TVA's section 10 permit.
☐	23	**SHF1** - Fire breaks will be used to define and limit burn scope.
☐	17, 23, 34	**SHF2** - Site-specific conditions (e.g., acres burned, transport wind speed, mixing heights) will be considered to ensure smoke is limited and adequately dispersed away from caves so that smoke does not enter cave or cave-like structures.
☐	23	**SHF3** - Acreage will be divided into smaller units to keep amount of smoke at any one time or location to a minimum and reduce risk for smoke to enter caves.
☐	17, 23, 34	**SHF4** - If burns need to be conducted when there is some potential for bats to present on the landscape and more likely to enter torpor due to colder temperatures, burns will only be conducted if the air temperature is 55° or greater, and preferably 60° or greater.
☐	23	**SHF5** - Fire breaks will be plowed immediately prior to burning, will be plowed as shallow as possible, and will be kept to minimum to minimize sediment.
☐	23	**SHF6** - Tractor-constructed fire lines will be established **greater than 200 feet from cave entrances**. Existing logging roads and skid trails will be used where feasible to minimize ground disturbance and generation of loose sediment.
☐	17, 22, 23, 32, 33, 34, 35, 36	**SHF7** - Burning will only occur if site specific conditions (e.g. acres burned, transport wind speed, mixing heights) can be modified to ensure that smoke is adequately dispersed away from caves or cave-like structures. This applies to prescribed burns and burn piles of woody vegetation.
☐	17, 22, 23, 32, 33, 34, 35, 36	**SHF8** - Brush piles will be burned a **minimum of 0.25 mile from documented, known, or obvious caves or cave entrances** and otherwise in the center of newly established ROW when proximity to caves on private land is unknown.

Project Review Form - TVA Bat Strategy *(04/2025)*

☐	17, 23, 34	**SHF9** - A **0.25 mile buffer of undisturbed forest** will be maintained around documented or known gray bat maternity and hibernation colony sites, documented or known Virginia big-eared bat maternity, bachelor, or winter colony sites, Indiana bat hibernation sites, northern long-eared bat hibernation sites, and tricolored bat hibernation sites. Prohibited activities within this buffer include cutting of overstory vegetation, construction of roads, trails or wildlife openings, and prescribed burning. Exceptions may be made for maintenance of existing roads and existing ROW, or where it is determined that the activity is compatible with species conservation and recovery (e.g., removal of invasive species).
■	33, 34	**TR1*** - Removal of potentially suitable summer roosting habitat during time of potential occupancy has been quantified and minimized programmatically. TVA will track and document alignment of activities that include tree removal (i.e., hazard trees, mechanical vegetation removal) with the programmatic quantitative cumulative estimate of seasonal removal of potential summer roost trees for Indiana bat and northern long-eared bat. Project will therefore communicate completion of tree removal to appropriate TVA staff.
☐	33, 34	**TR2** - Removal of suitable summer roosting habitat **within 0.5 mile of Priority 1/Priority 2 Indiana bat hibernacula, 0.25 mile of Priority 3/Priority 4 Indiana bat hibernacula, 0.25 miles of any northern long-eared bat hibernacula, or 0.25 miles of any tricolored bat hibernacula** will be prohibited, regardless of season, with very few exceptions (e.g., vegetation maintenance of TL ROW immediately adjacent to a known cave).
☐	33, 34	**TR3*** - Removal of suitable summer roosting habitat within documented habitat (i.e., within 10 miles, 5 miles, and 3 miles of documented Indiana bat, northern long-eared bat, and tricolored bat hibernacula, respectively; within 5 miles, 1.5 miles, and 1.5 miles of documented post-white-nose syndrome Indiana bat, northern long-eared bat, and tricolored bat capture sites, respectively; and within 2.5 miles, 0.25, and 0.25 miles of documented Indiana bat northern long-eared bat, and tricolored bat post-white-nose syndrome summer roost trees, respectively) will be tracked, documented, and included in annual reporting.
☐	33, 34	**TR4*** - Removal of suitable summer roosting habitat within potential habitat for Indiana bat, northern long-eared bat, and tricolored bat will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff.
☐	33, 34	**TR5*** - In areas where northern long-eared bat and tricolored bat remain active year-round, continuing to roost in trees, tree removal within documented habitat (1.5 miles of northern long-eared bat and tricolored bat post-white nose syndrome captures sites, and 0.25 miles of northern long-eared bat and tricolored bat post-white-nose syndrome roosts) will be tracked, documented, and included in annual reporting.
☐	33, 34	**TR6** - Removal of any trees within 0.25 miles of a documented Indiana bat maternity roost tree, or post-white nose syndrome northern long-eared bat or tricolored bat maternity summer roost tree or the roost tree itself during pup season, will first require a site-specific review and assessment. If pups are present in trees to be removed (determined either by mist netting and assessment of pregnant, lactating, or post lactating adult females, or by visual assessment of trees following evening emergence counts for Indiana bats and northern long-eared bats), TVA will coordinate with the USFWS to determine how to avoid direct and minimize indirect impacts to pups to the extent possible. This may include establishment of artificial roosts before loss of roost tree(s).
☐	33, 34	**TR7** - In areas where northern long-eared bat and tricolored bat remain active year-round, continuing to roost in trees, tree removal within 0.25 miles of documented post-white-nose syndrome northern long-eared bat or tricolored bat roosts during winter torpor TVA will coordinate with the USFWS to determine how to avoid direct and minimize indirect impacts to pups to the extent possible.
☐	33, 34	**TR8** (**Existing Transmission ROW only**) - **Tree removal within 100 feet of existing transmission ROWs will be limited to hazard trees**. On or adjacent to TLs, a hazard tree is a tree that is tall enough to fall within an unsafe distance of TLs under maximum sag and blowout conditions and/or are also dead, diseased, dying, and/or leaning. Hazard tree removal includes removal of trees that 1) currently are tall enough to threaten the integrity of operation and maintenance of a TL or 2) have the ability in the future to threaten the integrity of operation and maintenance of a TL.
☐	33, 34	**TR9** (**TVA Reservoir Land only**) - Requests for removal of hazard trees on or adjacent to TVA reservoir land will be inspected by staff knowledgeable in identifying hazard trees per International Society of Arboriculture and TVA's checklist for hazard trees. Approval will be limited to trees with a defined target.
☐	33, 34	**TR10** - If removal of suitable summer roosting habitat occurs when bats are present on the landscape, a funding contribution (based on amount of habitat removed) towards future conservation and recovery efforts for federally listed bats would be carried out. Project can consider seasonal bat presence/absence surveys (mist netting or emergence counts) that allow for positive detections without resulting in increased constraints in cost and project schedule. This will enable TVA to contribute to increased knowledge of bat presence on the landscape while carrying out TVA's broad mission and responsibilities.

Project Review Form - TVA Bat Strategy *(04/2025)*

☑	69, 77, 89, 91	**AR1** - Projects that involve structural modification or demolition of buildings, bridges, and potentially suitable box culverts, will require assessment to determine if structure has characteristics that make it a potentially suitable unconventional bat roost. If so a survey to determine if bats may be present will be conducted following the USFWS Survey Guidelines. Structural assessment will include: ○ Visual check that includes an exhaustive internal/external inspection of building to look for evidence of bats (e.g., bat droppings, roost entrance/exit holes); this can be done at any time of year, preferably when bats are active. ○ Where accessible and health and safety considerations allow, a survey of roof space for evidence of bats (e.g., droppings, scratch marks, staining, sightings), noting relevant characteristics of internal features that provide potential access points and roosting opportunities. Suitable characteristic may include: gaps between tiles and roof lining, access points via eaves, gaps between timbers or around mortise joints, gaps around top and gable end walls, gaps within roof walling or around tops of chimney breasts, and clean ridge beams. ○ Features with high-medium likelihood of harboring bats but cannot be checked visually include soffits, cavity walls, space between roof covering and roof lining. ○ Applies to culverts that are at least 23 feet in length with one or more of the following characteristics that make the culvert potentially suitable: • Minimum culvert entrance height/diameter 3 feet • Openings protected from high winds • Not susceptible to enough flooding that the remaining unflooded space would be less than 3 feet. • Inner areas relatively dark with roughened walls or ceilings (this may include corrugated metal culverts with rusting walls) • Crevices, weep holes, imperfections, or swallow nests ○ Bridge survey protocols will be adapted from the latest USFSW Survey Guidelines. ○ Bat surveys usually are NOT needed in the following circumstances: • Domestic garages /sheds with no enclosed roof space (with no ceiling) • Modern flat-roofed buildings • Metal framed and roofed buildings • Buildings where roof space is regularly used (e.g., attic space converted to living space, living space open to rafters) or where all roof space is lit from skylights or windows. Large/tall roof spaces may be dark enough at apex to provide roost space
☐	69, 77, 89, 91	**AR2** - Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present).
☐	91	**AR3** - Bridge survey protocols will be implemented, either by permittee (e.g., state DOT biologists) or qualified personnel. If a bridge is determined to be in use as an unconventional roost per the latest USFWS Guidelines, subsequent protocols will be implemented.
☐	69, 89	**AR4** - Removal of buildings with suitable roost characteristics within six miles of known or presumed occupied roosts for Virginia big-eared bat would occur between Nov 16 and Mar 31. Buildings may be removed other times of the year once a bat biologist evaluates a buildings' potential to serve as roosting habitat and determines that this species is not present and/or is not using structure(s).

Project Review Form - TVA Bat Strategy *(04/2025)*

☒	16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 56, 61, 62, 63, 64, 65, 67, 69, 84, 89	**SSPC1** (**Transmission only**) - Transmission actions and activities will continue to Implement A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities. This focuses on control of sediment and pollutants, including herbicides. Following are key measures: ○ BMPs minimize erosion and prevent/control water pollution in accordance with state-specific construction storm water permits. BMPS are designed to keep soil in place and aid in reducing risk of other pollutants reaching surface waters, wetlands and ground water. BMPs will undertake the following principles: • Plan clearing, grading, and construction to minimize area and duration of soil exposure. • Maintain existing vegetation wherever and whenever possible. • Minimize disturbance of natural contours and drains. • As much as practicable, operate on dry soils when they are least susceptible to structural damage and erosion. • Limit vehicular and equipment traffic in disturbed areas. Keep equipment paths dispersed or designate single traffic flow paths with appropriate road BMPs to manage runoff. • Divert runoff away from disturbed areas. • Provide for dispersal of surface flow that carries sediment into undisturbed surface zones with high infiltration capacity and ground cover conditions. • Prepare drainage ways and outlets to handle concentrated/increased runoff. • Minimize length and steepness of slopes. Interrupt long slopes frequently. • Keep runoff velocities low and/or check flows. • Trap sediment on-site. • Inspect/maintain control measures regularly & after significant rain. • Re-vegetate and mulch disturbed areas as soon as practical. ○ Specific guidelines regarding sensitive resources and buffer zones: • Extra precaution (wider buffers) within SMZs is taken to protect stream banks and water quality for streams, springs, sinkholes, and surrounding habitat. • BMPs are implemented to protect and enhance wetlands. Select use of equipment and seasonal clearing is conducted when needed for rare plants; construction activities are restricted in areas with identified rare plants. • Standard requirements exist to avoid adverse impacts to caves, protected animals, unique/ important habitat (e.g., cave buffers, restricted herbicide use, seasonal clearing of suitable habitat).
☒	16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71, 73, 76, 77, 78, 80, 81, 82, 83, 86, 87, 88, 89, 90	**SSPC2** - Operations involving chemical/fuel storage or resupply and vehicle servicing will be handled outside of riparian zones (streamside management zones) in a manner to prevent these items from reaching a watercourse. Earthen berms or other effective means are installed to protect stream channel from direct surface runoff. Servicing will be done with care to avoid leakage, spillage, and subsequent stream, wetland, or ground water contamination. Oil waste, filters, other litter will be collected and disposed of properly. Equipment servicing and chemical/fuel storage will be limited to locations greater than 300-ft from sinkholes, fissures, or areas draining into known sinkholes, fissures, or other karst features.

Project Review Form - TVA Bat Strategy *(04/2025)*

☐	16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 69, 70, 71, 73, 76, 77, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91	**SSPC3** (**Power Plants only**) - Power Plant actions and activities will continue to implement standard environmental practices. These include: ○ Best Management Practices (BMPs) in accordance with regulations: • Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy • Maintain every site with well-equipped spill response kits, included in some heavy equipment • Conduct Quarterly Internal Environmental Field Assessments at each sight • Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant. • When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage ○ Construction Site Protection Methods • Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites • Storm drain protection device • Check dam to help slow down silt flow • Silt fencing to reduce sediment movement ○ Storm Water Pollution Prevention (SWPP) Pollution Control Strategies • Minimize storm water contact with disturbed soils at construction site • Protect disturbed soil areas from erosion • Minimize sediment in storm water before discharge • Prevent storm water contact with other pollutants • Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac) ○ Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to • Minimize fuel and chemical use Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy • Maintain every site with well-equipped spill response kits, included in some heavy equipment • Conduct Quarterly Internal Environmental Field Assessments at each sight • Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant. • When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage ○ Construction Site Protection Methods • Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites • Storm drain protection device • Check dam to help slow down silt flow • Silt fencing to reduce sediment movement ○ Storm Water Pollution Prevention (SWPP) Pollution Control Strategies • Minimize storm water contact with disturbed soils at construction site • Protect disturbed soil areas from erosion • Minimize sediment in storm water before discharge • Prevent storm water contact with other pollutants • Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac) ○ Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to minimize fuel and chemical use
☐	17, 22, 32, 33, 34, 35, 36	**SSPC4** (**Transmission only**) - Woody vegetation burn piles associated with transmission construction will be placed in the center of newly established ROWs to minimize wash into any nearby undocumented caves that might be on adjacent private property and thus outside the scope of field survey for confirmation. Brush piles will be burned a **minimum of 0.25 miles from documented caves** and otherwise in the center of newly established ROW when proximity to caves on private land is unknown.

Project Review Form - TVA Bat Strategy *(04/2025)*

☐	17, 18, 21, 22, 24, 25, 26, 30, 31, 33, 34, 35, 36, 40, 46, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 66, 67, 68, 69, 70, 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 87, 88, 91, 93, 95, 96	**SSPC5** (**26a, Solar, Economic Development only**) - Section 26a permits and contracts associated with solar projects, economic development projects or land use projects include standards and conditions that include standard BMPs for sediment and contaminants as well as measures to avoid or minimize impacts to sensitive species or other resources consistent with applicable laws and Executive Orders.
☐	21, 54	**SSPC6** - Herbicide use will be avoided **within 200 ft of portals associated with caves, cave collapse areas, mines and sinkholes** are capable of supporting cave-associated species. Herbicides are not applied to surface water or wetlands unless specifically labeled for aquatic use. Filter and buffer strips will conform at least to federal and state regulations and label requirements.
☐	17, 21, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 54, 55	**SSPC7** - Clearing of vegetation **within a 200-ft radius of documented caves** will be limited to hand or small machinery clearing only (e.g., chainsaws, bush-hog, mowers). This will protect potential recharge areas of cave streams and other karst features that are connected hydrologically to caves.
☑	16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86	**L1** - Direct temporary lighting away from suitable habitat during the active season.
☑	16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86	**L2** - Evaluate the use of outdoor lighting during the active season and seek to minimize light pollution when installing new or replacing existing permanent lights by angling lights downward or via other light minimization measures (e.g., dimming, directed lighting, motion-sensitive lighting).

[1]Bats addressed in consultation (04/2018) and updates (05/2023 and 10/2024), which includes gray bat (listed in 1976), Indiana bat (listed in 1967), northern long-eared bat (listed in 2015), tricolored bat (anticipated listing in the future), and Virginia big-eared bat (listed in 1979).

NOTES (additional info from field review, explanation of no impact or removal of conservation measures).

Project Review Form - TVA Bat Strategy *(04/2025)*

STEP 13) Save completed form (Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date") in project environmental documentation (e.g. CEC, Appendix to EA) AND send a copy of form to batstrategy@tva.gov
Submission of this form indicates that Project Lead/Applicant:

Jessica Lyon (name) is (or will be made) aware of the requirements below.

- Implementation of conservation measures identified in Table 4 is required to comply with TVA's Endangered Species Act programmatic bat consultation.
- TVA may conduct post-project monitoring to determine if conservation measures were effective in minimizing or avoiding impacts to federally listed bats.

For Use by Terrestrial Zoologist Only

☒ For projects that require use of Take and/or contribution to TVA's Bat Conservation Fund, Terrestrial Zoologist acknowledges that Project Lead/Contact has been informed that project will result in use of Incidental Take 0.00 ◉ ac ○ trees and that use of Take will require $ 0.00 contribution to TVA's Conservation Fund upon completion of activity (amount entered should be $0 if cleared in winter).

Terrestrial Zoologist acknowledges that Project Lead/Contact (name) Jessica Lyon has been informed of any relevant conservation measures and/or provided a copy of this form.

Terrestrial Zoologist Acknowledgment. Finalize and Print to Non-Editable PDF

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Appendix G – Prime Farmland – Form AD 1006

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U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 5/12/2025		
Name of Project Hampton Station Substation	Federal Agency Involved TVA		
Proposed Land Use Electrical Substation and transmission	County and State Montgomery County, Tennessee		
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 5/12/2025	Person Completing Form: Jennifer Fedenko	
Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated 0	Average Farm Size 169 acres
Major Crop(s) Corn	Farmable Land In Govt. Jurisdiction Acres: 304,975 % 87.8	Amount of Farmland As Defined in FPPA Acres: 112,374 % 32.3	
Name of Land Evaluation System Used Montgomery LESA	Name of State or Local Site Assessment System N/A	Date Land Evaluation Returned by NRCS 5/14/2025	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	124.67			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	124.67			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	76.6			
B. Total Acres Statewide Important or Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.068			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	23			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	80			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	10			
2. Perimeter In Non-urban Use	(10)	10			
3. Percent Of Site Being Farmed	(20)	20			
4. Protection Provided By State and Local Government	(20)	20			
5. Distance From Urban Built-up Area	(15)	0			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	4.5			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	0			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	69.5	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	80	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	69.5	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	139.5	0	0	0

Site Selected: Site A	Date Of Selection 5/14/2025	Was A Local Site Assessment Used? YES ☐ NO ☑

Reason For Selection:

Total points for Site A are below the 160 threshold. Therefore, consideration of alternative sites is not required

Name of Federal agency representative completing this form: Angela French	Date: 5/14/2025

(See Instructions on reverse side) **Form AD-1006 (03-02)**

USDA
United States Department of Agriculture

May 14, 2025

Angela French
Environmental Planner / NEPA Specialist
Environmental and Social Impact Assessment Team / WSP

Montgomery County, TN – TVA Hampton Station Substation Project

Dear Angela French,

Attached is the completed AD-1006 form for the TVA Hampton Station Substation project in Montgomery County, Tennessee. The project under evaluation contains prime farmland and/or farmland of statewide importance.

Following the completion of Parts VI and VII, please return a copy of the form to tnhawc@usda.gov.

For your reference, NRCS policy and procedures on prime and unique farmlands are published in the Code of Federal Regulations 7 CFR 657.
The website is: https://www.ecfr.gov/current/title-7/subtitle-B/chapter-VI/subchapter-F/part-657?toc=1

Please let me know if you have any questions.

Sincerely,

JENNIFER FEDENKO
Digitally signed by JENNIFER FEDENKO
Date: 2025.05.14 07:36:17 -05'00'

Jennifer Fedenko
State Resource Soil Scientist
Natural Resources Conservation Service
Tennessee State Office

Natural Resources Conservation Service
801 Broadway, 675 U.S. Courthouse
Nashville, Tennessee 37203
Voice (615) 277-2531 Fax (855) 591-1284

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

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Appendix H – Noise During Transmission Line Construction and Operation

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

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

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

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

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

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

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

Construction Noise

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

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

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

Operational Noise

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

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

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

Literature Cited

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