

## APPENDIX A – NOTICE OF INTENT

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NACJD/home.html." and inserting "http://www.ICPSR.umich.edu/NACJD/archive.html".

[PR Doc. 01-29466 Filed 11-26-01; 3:45 am]

BILLING CODE 2219-49-P

#### TENNESSEE VALLEY AUTHORITY

##### Environmental Impact Statement for 500-kV Transmission Line in Middle Tennessee

AGENCY: Tennessee Valley Authority.

ACTION: Notice of intent.

**SUMMARY:** The Tennessee Valley Authority (TVA) will prepare an environmental impact statement (EIS) addressing the proposed construction and operation of a new 500-kV transmission system in northern Middle Tennessee. This 500-kV transmission line would be located within a study area extending from near Cumberland City northeast to Clarksville and southeast to near Nashville, and including parts of seven counties in Tennessee. The EIS will evaluate the potential environmental impacts of the construction, operation, and maintenance of the line. TVA will use the EIS process to obtain public involvement on this proposal. Public comment is invited concerning both the scope of the EIS and environmental issues that should be addressed as a part of this EIS.

**DATES:** Comments on the scope and environmental issues for the EIS must be postmarked or e-mailed no later than December 31, 2001 to ensure consideration. Late comments will receive every consideration possible.

**ADDRESSES:** Written comments should be sent to Charles P. Nicholson, NEPA Specialist, Environmental Policy and Planning, Tennessee Valley Authority, mail stop WT 8C, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1499. Comments may be e-mailed to [cpnicholson@tva.gov](mailto:cpnicholson@tva.gov).

**FOR FURTHER INFORMATION CONTACT:** Hugh S. Barger, Transmission/Power Supply, Tennessee Valley Authority, mail stop MR 4G-C, 1101 Market Street, Chattanooga, Tennessee 37402-2801. Telephone (423) 751-3131. E-mail may be sent to [hsbarger@tva.gov](mailto:hsbarger@tva.gov).

#### SUPPLEMENTARY INFORMATION:

##### Background

Electric loads in the Nashville and surrounding areas of Middle Tennessee have grown steadily in the recent past and are projected to continue to grow. In addition, new electrical generation is being connected to the TVA system,

particularly in the western portion of the TVA service area. These two factors have combined to create two potentially serious problems: transmission system overloading and damage to electrical generating units.

TVA has studied this problem and has tentatively concluded that the best method of remedying these problems is the construction of a new 500-kV transmission line that would allow the additional movement of large quantities of power from the western part of its system to the Middle Tennessee area.

##### Project Description

The project would involve the construction of a new 500-kV transmission line from TVA's Cumberland Fossil Plant to one of two locations; either TVA's Montgomery, TN 500-kV substation located northeast of Clarksville, or TVA's Davidson, TN 500-kV substation located southwest of Nashville. The line would likely be built using self-supporting, laced steel towers on right-of-way 175 feet in width. A line to the Montgomery substation would be around 30 miles long, and a line to the Davidson substation would be around 45 miles long. Neither detailed routing studies nor line design studies have yet been conducted. The line structure type, right-of-way characteristics, and line length remain to be determined and could change when additional information is gathered.

Line construction would require removal of trees within the line right-of-way as well as any other nearby tall trees which would endanger the safe operation of the line. Construction of the support structures would require the excavation of foundations for each of the tower legs. Cranes and other heavy equipment would be needed to construct the towers and pull the electrical conductor into place. After construction, the land disturbed would be restored and the right-of-way would be periodically maintained to prevent the growth of tall vegetation which would endanger the line. The EIS will provide a detailed description of these activities, as well as applicable and appropriate environmental protection measures.

After the completion of scoping, TVA will begin its detailed line routing studies using maps, aerial photography and other relevant data. When the studies have progressed sufficiently, potentially affected landowners will be contacted directly, and additional field surveys will be conducted.

##### Proposed Issues To Be Addressed

The EIS will describe the existing environmental and socioeconomic

resources within the area that would be affected by construction and operation of a transmission line. TVA's evaluation of environmental impacts to these resources will include, but not necessarily be limited to, the potential impacts on water quality, aquatic and terrestrial ecology, endangered and threatened species, wetlands, aesthetics and visual resources, land use, historic and archaeological resources, and socioeconomic resources.

##### Alternatives

The results of evaluating the potential environmental impacts and other important issues identified in the scoping process, as well as, engineering and economic considerations will be used by TVA in selecting a preferred alternative. At this time, the range of alternatives TVA has identified for detailed evaluation include no action and construction and operation of a 500-kV transmission line from Cumberland Fossil Plant to one of two possible sites.

##### Scoping Process

Scoping, which is integral to the NEPA process, is a procedure that solicits public input to the EIS process to ensure that: (1) issues are identified early and properly studied; (2) issues of little significance do not consume substantial time and effort; (3) the draft EIS is thorough and balanced; and (4) delays caused by an inadequate EIS are avoided. TVA's NEPA procedures require that the scoping process commence soon after a decision has been reached to prepare an EIS in order to provide an early and open process for determining the scope and for identifying the significant issues related to a proposed action. The scope of alternatives and issues to be addressed in the draft EIS will be determined, in part, from written comments submitted by mail or e-mail, and comments presented orally or in writing at public meetings. The preliminary identification in this notice of reasonable alternatives and environmental issues is not meant to be exhaustive or final.

The scoping process will include both interagency and public scoping. The public is invited to submit written comments or e-mail comments on the scope of this EIS no later than the date given under the DATES section of this notice.

TVA will conduct two public scoping meetings within the project study area. The first meeting will be held at the Tennesco Community Center, 115 Tennesco Drive in Dickson, Tennessee on November 28, 2001 and the second will be held at the Burt-Cobb Community Center, 1011 Franklin Street in

Clarksville, Tennessee on November 29, 2001. These informal meetings will begin at 1 p.m. and end at 7 p.m. At each meeting, TVA management and project staff will present overviews of the EIS process and the proposed transmission line project, answer questions, and solicit comments on the issues that the public would like addressed in the EIS. These meetings will be publicized through notices in local newspapers, by TVA press releases, on the TVA Web site at <http://www.tva.gov/environment/calendar.htm> and in letters to local elected officials preceding the public meetings.

The agencies to be included in the interagency scoping are U.S. Army Corps of Engineers, U.S. Army—Fort Campbell, U.S. Fish and Wildlife Service, Tennessee Department of Environment and Conservation, the Tennessee State Historic Preservation Officer and other federal, state, and local agencies, as appropriate. After consideration of the scoping comments, TVA will further identify alternatives and environmental issues to be addressed in the EIS. Following analysis of the environmental consequences of each alternative, TVA will prepare a draft EIS for public review and comment. Notice of availability of the draft EIS will be published by the Environmental Protection Agency in the **Federal Register**. TVA will solicit written comments on the draft EIS, and information about possible public meetings to comment on the draft EIS will be announced. TVA expects to release a draft EIS by late summer, 2002 and a final EIS by June 2003.

Dated: November 20, 2001.

**Kathryn J. Jackson,**

*Executive Vice President, River Systems Operations & Environment.*

[FR Doc. 01-29490 Filed 11-26-01; 8:45 am]

BILLING CODE 8120-88-P

## TENNESSEE VALLEY AUTHORITY

### Meetings; Sunshine Act

**AGENCY HOLDING THE MEETING:** Tennessee Valley Authority (Meeting No. 1536).

**TIME AND DATE:** 8:30 a.m. (EST), November 30, 2001.

**PLACE:** TVA West Tower Auditorium, 400 West Summit Hill Drive, Knoxville, Tennessee.

**STATUS:** Open.

#### Agenda

Approval of minutes of meeting held on October 24, 2001.

## New Business

### A—Budget and Financing

A1. Approval of Fiscal year 2001 Financial Statements.

A2. Approval of tax-equivalent payments for Fiscal Year 2001 and estimated payments in Fiscal Year 2002 in accordance with Section 13 of the TVA Act.

### B—Purchase Awards

B1. Supplement to Contract No. 999997541 with Marsh USA Inc., to provide coverage for the integrated risk insurance program.

B2. Supplements to contracts with United HealthCare of Tennessee and Cigna HealthCare of Tennessee for health maintenance organization benefit plan options.

B3. Supplement to Contract No. 99999115 with Connecticut General Life Insurance Company for dental health services.

### C—Energy

C1. Contract with Guy F. Atkinson Construction, LLC, for the design and construction of a low-level outlet at the Blue Ridge Dam.

C2. Contract with General Electric International, Inc., to provide combustion turbine parts and services for TVA's new combustion turbine units located at Gallatin, Johnsonville, Lagoon Creek, and Kemper sites.

C3. Contract with ALSTOM Power, Inc., to provide large steam turbine/generator parts and services.

C4. Sale at public auction of a coal lease on the TVA Koppers property and delegation of authority to the Vice President of Fuel Supply and Engineering Services to administer and amend the lease.

C5. Proposed increases in prices under Dispersed Power Price Schedule—CSPP.

### E—Real property Transaction

E1. Abandonment of an easement affecting approximately .5 acre of land on Wautauga Reservoir (a portion of Tract Nos. WAR-387F, War-592F, and WAR-594F) in Carter County, Tennessee.

### Information Items

1. Winning Performance Team Incentive Plan payout.

2. Delegation of interim approval authority to the President and Chief Operating Officer, or a designee, for certain power purchase agreements for small renewable fueled generation projects.

3. Approval of the modification of contracts with Lodestar Energy, Inc., for

coal supply to Johnsonville, Colbert Unit 5, the Cumberland Fossil Plants.

4. Renegotiation of Contract No. P06P06-100931 under a reopener provision with Ingram Barge Company for coal transportation services to Colbert, Cumberland, Johnsonville, and Widows Creek Fossil Plants.

5. Delegation of authority to the Manager, Watershed Technical Services, or a designee, and the Chief Financial Officer, or a designee, to grant leases concerning eight combustion turbines and related facilities located at Lagoon Creek Combustion Turbine Plant and take other actions with respect to the transfer of real property interests related to the lease arrangements.

6. Release of a restrictive covenant affecting approximately 28.3 acres of TVA land on Wheeler Reservoir in Morgan County, Alabama (Tract No. XWR-384).

7. Contract with The Buntin Group for marketing services primarily for the Energy Right<sup>®</sup> and Green Power Switch<sup>®</sup> programs.

8. Cooperative agreement with Memphis Light, Gas and Water to support low-income energy conservation demonstration in the MLGW service area.

9. Enhancements to TVA's efforts to recruit and retain employees and reward excellence in business performance and public service ("the 3Rs").

For more information: Please call TVA Media Relations at (865) 632-6000, Knoxville, Tennessee. Information is also available at TVA's Washington Office (202) 898-2999. People who plan to attend the meeting and have special needs should call (865) 632-6000.

Dated: November 21, 2001.

**Maureen H. Dunn,**

*General Counsel and Secretary.*

[FR Doc. 01-29582 Filed 11-23-01; 12:30 pm]

BILLING CODE 8120-88-W

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### Public Notice for Waiver of Aeronautical Land-Use Assurance; Greater Kankakee Airport, Kankakee, IL

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Notice of intent of waiver with respect to land.

**SUMMARY:** The Federal Aviation Administration (FAA) is considering a proposal to change a portion of airport land from aeronautical use to non-

## APPENDIX B – RIGHT-OF-WAY CLEARING SPECIFICATIONS

1. General - The clearing contractor shall review the environmental evaluation documents for the project or proposed activity (categorical exclusion checklist, environmental assessment, or environmental impact statement) along with all clearing and construction appendices, conditions in applicable general and/or site specific permits, the storm water pollution prevention plan, and any TVA commitments to property owners. The contractor shall then plan and carry out operations using techniques consistent with good engineering and management practices as outlined in TVA's Best Management Practice (BMP) manual (Muncy 1999). The contractor will protect areas that are to be left unaffected by access or clearing work at and adjacent to all work sites. In sensitive areas and their buffers, the contractor will retain as much native ground cover and other vegetation as possible.

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

2. Regulations - The clearing contractor shall comply with all applicable federal, state, and local environmental and anti-pollution laws, regulations, and ordinances, including, without limitation, all air, water, solid and hazardous waste, noise, and nuisance laws, regulations, and ordinances. He shall secure, or ensure that TVA has secured, all necessary permits or authorizations to conduct work on the acres shown on the drawings and plan and profile for the contract. The contractor's designated project manager will actively seek to prevent, control, monitor and safely abate all commonly recognized forms of workplace and environmental pollution. Permits or authorizations and any necessary certifications of trained or licensed employees shall be documented with copies submitted to TVA's right-of-way inspector or construction environmental engineer before work begins. The contractor will be responsible for meeting all conditions specified in permits. Permit conditions shall be reviewed in pre-work discussions.
3. Land and Landscape Preservation - The clearing contractor shall exercise care to preserve the condition of cleared soils by avoiding as much compacting and deep scarring as possible. As soon as possible after initial disturbance of the soil and in accordance with any permit(s) or other state or local environmental regulatory requirements, cover material shall be placed to prevent erosion and sedimentation of water bodies or conveyances to surface or ground water. In areas outside the clearing, use, and access areas, the natural vegetation shall be protected from damage. The contractor and his employees must not deviate from delineated access routes or use areas, and must enter the site at designated areas that will be marked. Clearing operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the remaining natural vegetation and adjacent surroundings in the vicinity of the work. In sensitive public or environmental areas, appropriate buffer zones shall be observed and the methods of clearing or re-clearing modified to protect the buffer

and sensitive area. Some areas may require planting native plants or grasses to meet the criteria of regulatory agencies or commitments to special program interests.

4. Streamside Management Zones - The clearing contractor must leave as many rooted ground cover plants as possible in buffer zones along streams and other bodies of water or wet weather conveyances thereto. . In such streamside management zones (SMZ), tall growing tree species (trees that would interfere with TVA's National Electric Safety Code clearances) shall be cut, and the stumps may be treated to prevent re-sprouting. Low growing trees identified by TVA as marginal electrical clearance problems may be cut, then stump treated with growth regulators to allow low, slow growing canopy development and active root growth. Only approved herbicides shall be used, and herbicide application shall be conducted by certified applicators from the TOM organization after initial clearing and construction. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment, such as a feller-buncher. The method will be selected based on site specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. Disturbed soils in SMZs must be stabilized by appropriate methods immediately after the right-of-way is cleared. Stabilization must occur within the time frame specified in applicable storm water permits or regulations. Stumps within SMZs may be cut close to the ground but must not be removed or uprooted. Trees, limbs, and debris shall be immediately removed from streams, ditches, and wet areas using methods which will minimize dragging or scarring the banks or stream bottom. No debris will be left in the water or watercourse. Equipment will cross streams, ditches, or wet areas only at locations designated by TVA after the application of appropriate erosion control BMPs consistent with permit conditions or regulatory requirements.
5. Wetlands - In forested wetlands, tall trees will be cut near the ground, leaving stumps and roots in place. The cambium may be treated with herbicides applied by certified applicators from the TOM organization to prevent regrowth. Understory trees that must be initially cut and removed may be allowed to grow back or may be treated with tree growth regulators selectively to slow growth and increase the reclearing cycle. The decision will be situationally made based on existing ground cover, wetland type, and tree species since tall tree removal may "release" understory species and allow them to quickly grow to "electrical clearance problem" heights. In many circumstances herbicides labeled for water and wetland use may be used in reclearing.
6. Sensitive Area Preservation - If prehistoric or historic artifacts or features that might be of archaeological significance are discovered during clearing or re-clearing operations, the activity shall immediately cease within a 100-foot radius, and a TVA right-of-way inspector or construction environmental engineer and the Cultural Resources Program Manager shall be notified. The site shall be protected and left as found until a determination about the resources, their significance, and site treatment is made by TVA's Cultural Resources Program. Work may continue beyond the finding zone and the 100-foot radius beyond its perimeter.
7. Water Quality Control - The contractor's clearing and disposal activities shall be performed using BMPs that will prevent erosion and entrance of spillage, contaminants, debris, and other pollutants or objectionable materials into drainage ways, surface waters or ground water. Special care shall be exercised in refueling equipment to prevent spills. Fueling areas shall be remote from any sinkhole, crevice,

stream or other water body. Open burning debris will be kept away from streams and ditches and shall be incorporated into the soil.

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

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

Mechanized equipment shall not be operated in flowing water except when approved; and then only to construct necessary stream crossings under direct guidance of TVA.

Construction of stream fords or other crossings will only be permitted at approved locations and to current TVA construction access road standards. Material shall not be deposited in watercourses or within stream bank areas where it could be washed away by high stream flows. Any clearing debris which enters streams or other water bodies shall be removed as soon as possible. Appropriate Corps of Engineers and state permits shall be obtained for stream crossings.

9. Air Quality Control - The clearing or re-clearing contractor shall take appropriate actions to limit the amount of air emissions created by clearing and disposal operations to well within the limits of clearing or burning permits and/or Forestry or local fire department requirements. All operations must be conducted in a manner which prevents nuisance conditions or damage to adjacent land crops, dwellings, highways or people.
10. Dust and Mud Control - Clearing activities shall be conducted in a manner which minimizes the creation of fugitive dust. This may require limitations as to type of equipment, allowable speeds, and routes utilized. Control measures such as water, gravel, etc., or similar measures may be used subject to TVA approval. On new construction sites and easements, the last 100 feet before an access road approaches a county road or highway shall be graveled to prevent transfer of mud on to the public road.
11. Burning - The Contractor shall obtain applicable permits and approvals to conduct controlled burning. The Contractor will comply with all provisions of the permit, notification or authorization including burning site locations, controlled draft, burning hours, and such other conditions as stipulated. If weather conditions such as wind speed or wind direction change rapidly, the Contractor's burning operation may be

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

12. Smoke and Odors - The Contractor will properly store and handle combustible and volatile materials which could create objectionable smoke, odor, or fumes. The Contractor shall not burn oil or refuse that includes trash, rags, tires, plastics, or other manufactured debris.
13. Vehicle Exhaust Emissions - The Contractor shall maintain and operate equipment in a manner which limits vehicle exhaust emissions. Equipment and vehicles will be kept within the manufacturer's recommended limits and tolerances. Excessive exhaust gases will be eliminated and inefficient operating procedures will be revised or halted until corrective repairs or adjustments are made.
14. Vehicle Servicing - Routine maintenance of personnel vehicles will not be performed on the right-of-way. However, if emergency or "have to" situations arise, minimal/temporary maintenance to personnel vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Heavy equipment will be serviced on the right-of-way, except in designated sensitive areas. The clearing or re-clearing contractor will properly maintain these vehicles with approved spill protection controls and countermeasures. If emergency maintenance in a sensitive or questionable area arises, the area environmental coordinator or construction environmental engineer will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.
15. Noise Control - The Contractor shall take steps to avoid the creation of excessive sound levels for employees, the public, or the site and adjacent property owners. Concentration of individual noisy pieces as well as the hours and locations of operation should be considered.
16. Noise Suppression - All internal combustion engines shall be properly equipped with mufflers. The equipment and mufflers shall be maintained at peak operating efficiency.
17. Sanitation - A designated representative of TVA or the clearing contractor shall contact a sanitary contractor who will provide sanitary chemical toilets convenient to all principal points of operation for every working party. The facilities shall comply with applicable federal, state, or local health laws and regulations. They shall not be located closer than 100 feet to any stream or tributary or to any wetland. The facilities shall be required to have proper servicing and maintenance, and the waste disposal contractor shall verify in writing that the waste disposal will be in state-approved facilities. Employees shall be notified of sanitation regulations and shall be required to use the toilet facilities.
18. Refuse Disposal - The clearing or re-clearing contractor shall be responsible for daily cleanup and proper labeling, storage and disposal of all refuse and debris on the site produced by his operations and employees. Facilities which meet applicable

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

19. Brush and Timber Disposal (Re-clearing) - The re-clearing contractor shall place felled tree boles in neat stacks at the edge of the right-of-way, with crossing breaks at least every 100 feet. Property owner requests shall be reviewed with the project manager or right-of-way specialist before accepting them. Lop and drop activities must be specified in the contract and on plan and profile drawings with verification with the right-of-way specialist before conducting such work. When tree trimming and chipping is necessary disposal of the chips on the easement or other locations on the property must be with the consent of the property owner and the approval of the right-of-way specialist. No trees, branches, or chips shall remain in a surface water body or be placed at a location where washing into a surface or ground water source might occur.
20. Brush and Timber Disposal (Initial Clearing) - For initial clearing, trees are commonly part of the contractors contract to remove as they wish. Trees may be removed from the site for lumber or pulp wood or they may be chipped or stacked and burned. All such activities must be coordinated with the TVA field engineer and the open burning permits, notifications and regulatory requirements must be met. Trees may be cut and left in place only in areas specified by TVA and approved by appropriate regulatory agencies. These areas may include sensitive wetlands or SMZs where tree removal would cause excessive ground disturbance or in very rugged terrain where windrowed trees are used as sediment barriers along the edge of the right-of-way.
21. Restoration of Site - All disturbed areas, with the exception of farmland under cultivation and any other areas as may be designated by TVA's specifications, shall be stabilized in the following manner unless the property owner and TVA's engineer specify a different method:
  - A. The subsoil shall be loosened to a minimum depth of 6 inches if possible and worked to remove unnatural ridges and depressions.
  - B. If needed, appropriate soil amendments will be added.
  - C. All disturbed areas will initially be seeded with a temporary ground cover such as winter wheat, rye, or millet, depending on the season. Perennials may also be planted during initial seeding if proper growing conditions exist. Final restoration and final seeding will be performed as line construction is completed. Final seeding will consist of permanent perennial grasses such as those outlined in TVA's "A Guide for Environmental Protection and Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities." Exceptions would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor
  - D. TVA holds the option, depending upon the time of year and weather condition, to delay or withdraw the requirement of seeding until more favorable planting conditions are certain. In the meantime, other stabilization techniques must be applied.

April 2000 Revision



## **APPENDIX C – ENVIRONMENTAL QUALITY PROTECTION SPECIFICATIONS FOR TRANSMISSION LINE CONSTRUCTION**

1. General - TVA and/or the assigned Contractor shall plan, coordinate, and conduct his operations in a manner which protects the quality of the environment and complies with TVA's environmental expectations discussed in the pre-construction meeting. This specification contains provisions which shall be considered in all TVA and contract construction operations. If the contractor fails to operate within the intent of these requirements, TVA will direct changes to operating procedures. Continued violation will result in a work suspension until correction or remedial action is taken by the contractor. Penalties and contract termination will be used as appropriate. The costs of complying with the Environmental Quality Protection Specifications are incidental to the contract work, and no additional compensation will be allowed. At all structure and conductor pulling sites, protective measures to prevent erosion will be taken immediately upon the end of each step in a construction sequence, and those protective measures shall be inspected and maintained throughout the construction and right-of-way rehabilitation period.
2. Regulations - TVA and/or the assigned contractor shall comply with all applicable federal, state, and local environmental and anti-pollution laws, regulations, and ordinances related to environmental protection and prevention, control, and abatement of all forms of pollution.
3. Use Areas - TVA and/or the assigned contractor's use areas include but are not limited to site office, shop, maintenance, parking, storage, staging, assembly areas, utility services, and access roads to the use areas. The construction contractor shall submit plans and drawings for their location and development to the TVA engineer and project manager for approval. Secondary containment will be provided for fuel and petroleum product storage pursuant to 29CFR1910.106(D)(6)(iii)(OSHA).
4. Equipment - All major equipment and proposed methods of operation shall be subject to the approval of TVA. The use or operation of heavy equipment in areas outside the right-of-way, access routes, or structure, pole, or tower sites will not be permitted without permission of the TVA inspector or field engineer. Heavy equipment use on steep slopes (greater than 20 percent) and in wet areas will be held to the minimum necessary to construct the transmission line. Steps will be taken to limit ground disturbance caused by heavy equipment usage, and erosion and sediment controls will be instituted on disturbed areas in accordance with state requirements.

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

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

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

5. Sanitation - A designated TVA or contractor representative shall contact a sanitary contractor who will provide sanitary chemical toilets convenient to all principal points of operation for every working party. The facilities shall comply with applicable federal, state, or local health laws and regulations. They shall not be located closer than 100 feet to any stream or tributary or to any wetland. The facilities shall be required to have proper servicing and maintenance, and the waste disposal contractor shall verify in writing that the waste disposal will be in state-approved facilities. Employees shall be notified of sanitation regulations and shall be required to use the toilet facilities.
6. Refuse Disposal - Designated TVA and/or contractor personnel shall be responsible for daily inspection, cleanup, and proper labeling, storage and disposal of all refuse and debris produced by his operations and by his employees. Suitable refuse collecting facilities will be required. Only state-approved disposal areas shall be used. Disposal containers such as dumpsters or roll-off containers shall be obtained from a proper waste disposal contractor. Solid, special, construction/demolition and hazardous wastes as well as scrap are part of the potential refuse generated and must be properly managed with emphasis on reuse, recycle, or possible give away, as appropriate, before they are handled as waste. Contractors must meet similar provisions on any project contracted by TVA.
7. Landscape Preservation - TVA and its contractors shall exercise care to preserve the natural landscape in the entire construction area as well as use areas, in or outside the right-of-way, and on or adjacent to access roads. Construction operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural vegetation and surroundings in the vicinity of the work.
8. Sensitive Areas Preservation - Certain areas on site and along the right-of-way may be designated by the specifications or the TVA engineer as environmentally sensitive. These areas include, but are not limited to areas classified as erodible, geologically sensitive, scenic, historical and archaeological, fish and wildlife refuges, water supply watersheds, and public recreational areas such as parks and monuments. Contractors and TVA construction crews shall take all necessary actions to avoid adverse impacts to these sensitive areas and their adjacent buffer zones. These actions may include suspension of work or change of operations during periods of rain or heavy public use; hours may be restricted or concentrations of noisy equipment may have to be dispersed. If prehistoric or historic artifacts or features are encountered during clearing or construction operations, the operations shall immediately cease for at least 100 feet in each direction, and TVA's right-of-way inspector or construction superintendent and Cultural Resources Program shall be notified. The site shall be left as found until a significance determination is made. Work may continue elsewhere, beyond the 100-foot perimeter.

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

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

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

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

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

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

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

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

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

12. Restoration of Site - All construction disturbed areas, with the exception of farmland under cultivation and any other areas as may be designated by TVA's specifications, shall be stabilized in the following manner unless the property owner and TVA's engineer specify a different method:
  - A. The subsoil shall be loosened to a minimum depth of 6 inches if possible and worked to remove unnatural ridges and depressions.
  - B. If needed, appropriate soil amendments will be added.
  - C. All disturbed areas will initially be seeded with a temporary ground cover such as winter wheat, rye, or millet, depending on the season. Perennials may also be planted during initial seeding if proper growing conditions exist. Final restoration and final seeding will be performed as line construction is completed. Final seeding will consist of permanent perennial grasses such as those outlined in TVA's "A Guide for Environmental Protection and Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities." Exceptions would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor.
  - D. TVA holds the option, depending upon the time of year and weather condition, to delay or withdraw the requirement of seeding until more favorable planting conditions are certain. In the meantime, other stabilization techniques must be applied.
13. Air Quality Control - Construction crews shall take appropriate actions to minimize the amount of air pollution created by their construction operations. All operations must be conducted in a manner which avoids creating a nuisance and prevents damage to lands, crops, dwellings, or persons.
14. Burning - Before conducting any open burning operations, the contractor shall obtain permits or provide notifications as required to state Forestry offices and/or local fire departments. Burning operations must comply with the requirements of state and local air pollution control and fire authorities and will only be allowed in approved locations and during appropriate hours and weather conditions. If weather conditions such as wind direction or speed change rapidly, the contractor's burning operations may be temporarily stopped by the TVA field engineer. The debris for burning shall be piled and shall be kept as clean and as dry as possible, then burned in such a manner to reduce smoke. No materials other than dry wood shall be open burned. The ash and debris shall be buried away from streams or other water sources and shall be in areas coordinated with the property owner.
15. Dust and Mud Control - Construction activities shall be conducted to minimize the creation of dust. This may require limitations as to types of equipment, allowable speeds, and routes utilized. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used subject to TVA's approval. On new construction sites and easements, the last 100 feet before an access

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

16. Vehicle Exhaust Emissions - TVA and/or the Contractors shall maintain and operate equipment to limit vehicle exhaust emissions. Equipment and vehicles that show excessive emissions of exhaust gasses and particulates due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective repairs or adjustments are made.
17. Vehicle Servicing - Routine maintenance of personnel vehicles will not be performed on the right-of-way. However, if emergency or "have to" situations arise, minimal/temporary maintenance to personnel vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Heavy equipment will be serviced on the right-of-way, except in designated sensitive areas. The Heavy Equipment Department within TVA or the construction contractor will properly maintain these vehicles with approved spill protection controls and countermeasures. If emergency maintenance in a sensitive or questionable area arises, the area environmental coordinator or construction environmental engineer will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.
18. Smoke and Odors - TVA and/or the Contractors shall properly store and handle combustible material which could create objectionable smoke, odors, or fumes. The Contractor shall not burn refuse such as trash, rags, tires, plastics, or other debris.
19. Noise Control - TVA and/or the contractor shall take measures to avoid the creation of noise levels that are considered nuisances, safety, or health hazards. Critical areas, including but not limited to residential areas, parks, public use areas, and some ranching operations, will require special considerations. TVA's criteria for determining corrective measures shall be determined by comparing the noise level of the construction operation to the background noise levels. Also, especially noisy equipment such as helicopters, pile drivers, air hammers, chippers, chain saws, or areas for machine shops, staging, assembly, or blasting may require corrective actions when required by TVA.
20. Noise Suppression - All internal combustion engines shall be properly equipped with mufflers as required by the Department of Labor's "Safety and Health Regulations for Construction." TVA may require spark arresters in addition to mufflers on some engines. Air compressors and other noisy equipment may require sound reducing enclosures in some circumstances.
21. Damages - The movement of construction crews and equipment shall be conducted in a manner which causes as little intrusion and damage as possible to crops, orchards, woods, wetlands, and other property features and vegetation. The contractor will be responsible for erosion damage caused by his actions and especially for creating conditions that would threaten the stability of the right-of-way or site soil, the structures, or access to either. When property owners prefer the correction of ground cover condition or soil and subsoil problems themselves, the section of the contract dealing with damages will apply.



## APPENDIX D – ENVIRONMENTAL QUALITY PROTECTION SPECIFICATIONS FOR TRANSMISSION SUBSTATION OR COMMUNICATIONS CONSTRUCTION

1. General - TVA and/or the assigned Contractor and subcontractors shall plan, coordinate, and conduct his or her operations in a manner which protects the quality of the environment and complies with TVA's environmental expectations discussed in the pre-construction meeting (including clearing and grading, or re-clearing and removal or dismantling). This specification contains provisions which shall be considered in all TVA and contract construction, dismantling, or forensic operations. If the contractor and his or her subcontractors fail to operate within the intent of these requirements, TVA will direct changes to operating procedures. Continued violation will result in a work suspension until correction or remedial action is taken by the contractor. Penalties and contract termination will be used as appropriate. The costs of complying with the Environmental Quality Protection Specifications are incidental to the contract work, and no additional compensation will be allowed. At all site perimeters, structure, foundation, conduit, grounding, fence, drainage ways, etc. appropriate protective measures to prevent erosion or release of contaminants will be taken immediately upon the end of each step in a construction, dismantling, or forensic sequence, and those protective measures shall be inspected and maintained throughout the construction and site stabilization and rehabilitation period.
2. Regulations - TVA and/or the assigned contractor and subcontractor(s) shall comply with all applicable federal, state, and local environmental and anti-pollution laws, regulations, and ordinances related to environmental protection and prevention, control, and abatement of all forms of pollution.
3. Use Areas - TVA and/or the assigned contractor's and/or subcontractor(s) use areas include but are not limited to site office, shop, maintenance, parking, storage, staging, assembly areas, utility services, and access roads to the use areas. The construction contractor and subcontractor(s) shall submit plans and drawings for their location and development to the TVA engineer and project manager for approval. Secondary containment will be provided for fuel and petroleum product storage pursuant to 29CFR1910.106(D)(6)(iii)(OSHA).
4. Equipment - All major equipment and proposed methods of operation shall be subject to the approval of TVA. The use or operation of heavy equipment in areas outside the right-of-way, access routes, site, or structure, pole, or tower sites will not be permitted without permission of the TVA inspector or field engineer. Heavy equipment use on steep slopes (greater than 20 percent) and in wet areas will be held to the minimum necessary to construct the transmission or communication facility. Steps will be taken to limit ground disturbance caused by heavy equipment usage, and erosion and sediment controls will be instituted on disturbed areas in accordance with state requirements and Best Management Practices.

No subsurface ground-disturbing equipment or stump removal equipment will be used by construction forces except on access roads or at the actual site, structure, pole, or tower sites, where only footing locations and controlled runoff diversions shall be created that disturb the soil. All other areas of ground cover or in place stumps and

roots shall remain in place (Note: Tracked vehicles disturb surface layer of the ground due to size and function.) Some disking of the right-of-way, access, and site(s) may occur for proper seedbed preparation.

Unless ponding previously occurred (i.e. existing low-lying areas), water should not be allowed to pond on the site or around structures, except around foundation holes; the water must be directed away from the site in as dispersed a manner as possible. At tower or structure sites some means of upslope interruption of potential overland flow and diversion around the footings should be provided as the first step in construction-site preparation. If leveling is necessary, it must be implemented by means that provide for continuous gentle, controlled, overland flow or percolation. A good grass cover, straw, gravel, or other protection of the surface must be maintained. Steps taken to prevent increases in the moisture content of the in-situ soils will be beneficial both during construction and over the service life of any anchor, foundation, or its structure.

5. Sanitation - A designated TVA or contractor and/or subcontractor(s) representative shall contract a sanitary contractor who will provide sanitary chemical toilets convenient to all principal points of operation for every working party. The facilities shall comply with applicable federal, state, or local health laws and regulations. They shall not be located closer than 100 feet to any stream or tributary or to any wetland. The facilities shall be required to have proper servicing and maintenance, and the waste disposal contractor shall verify in writing that the waste disposal will be in state-approved facilities. Employees shall be notified of sanitation regulations and shall be required to use the toilet facilities.
6. Refuse Disposal - Designated TVA and/or contractor and subcontractor(s) personnel shall be responsible for daily inspection, cleanup, and proper labeling, storage and disposal of all refuse and debris produced by his or her operations and by his or her employees. Suitable refuse collecting facilities will be required. Only state-approved disposal areas shall be used. Disposal containers such as dumpsters or roll-off containers shall be obtained from a proper waste disposal contractor. Solid, special, construction/demolition and hazardous wastes as well as scrap are part of the potential refuse generated and must be properly managed with emphasis on reuse, recycle, or possible give away, as appropriate, before they are handled as waste. Records of the amounts generated shall be provided to the site's or project's designated environmental specialist. Contractor(s) and subcontractor(s) must meet similar provisions on any project contracted by TVA. Final debris, refuse, product, and material removal is the responsibility of the contractor; unless special written agreement is made with the ultimate TVA owner of the site.
7. Landscape Preservation - TVA and its contractor(s) and subcontractor(s) shall exercise care to preserve the natural landscape in the entire construction, dismantling, or forensic area as well as use areas, in or outside the right-of-way, and on or adjacent to access roads. Construction operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural vegetation and surroundings in the vicinity of the work.
8. Sensitive Areas Preservation - Certain areas onsite and along the access and/or right-of-way may be designated by the specifications or the TVA engineer as environmentally sensitive. These areas include, but are not limited to areas classified as erodible, geologically sensitive, scenic, historical and archaeological, fish and wildlife refuges,

endangered species habitat, water supply watersheds, and public recreational areas such as parks and monuments. Contractors, their subcontractor(s) and TVA construction crews shall take all necessary actions to avoid adverse impacts to these sensitive areas and their adjacent buffer zones. These actions may include suspension of work or change of operations during periods of rain or heavy public use; hours may be restricted or concentrations of noisy equipment may have to be dispersed. If prehistoric or historic artifacts or features are encountered during clearing, grading, borrow, fill, construction, dismantling, or forensic operations, the operations shall immediately cease for at least 100 feet in each direction, and TVA's construction superintendent, project manager, or Area Environmental Program Administrator and TVA Cultural Resources Program shall be notified. The site shall be left as found until a significance determination is made. Work may continue elsewhere, beyond the 100-foot perimeter.

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

The clearing contractor erected erosion and/or sedimentation control shall be maintained and (when TVA or contract construction personnel are unable) the construction crew(s) shall maintain BMPs such as silt fences on steep slopes and adjacent to any stream, wetland, or other water body. Additional BMPs may be required for areas of disturbance created by construction activities and at sequential steps of construction at the same location on site. BMPs will be inspected, by the TVA field engineer or other designated TVA or contractor and/or subcontractor(s) personnel, routinely and during periods of high runoff, and any necessary repairs will be made as soon as practicable. BMP inspections and any required sampling will be conducted in accordance with permit requirements. Records of all inspections and sampling results will be maintained onsite, and copies of inspection forms and sampling results will be forwarded to the TVA project manager or supporting environmental specialist.

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

10. Turbidity and Blocking of Streams - Construction, dismantling, or forensic activities in or near Streamside Management Zones or other bodies of water shall be controlled to prevent the water turbidity from exceeding state or local water quality standards for that stream. **All conditions** of a general storm water permit, Aquatic Resource Alteration Permit or a site specific permit **shall be met** including monitoring of turbidity in receiving streams and/or storm water discharges and implementation of appropriate erosion and sediment control measures.

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

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

Mechanized equipment shall not be operated in flowing or standing water on substation, switching station or telecommunication sites.

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

11. Floodplain Evaluation - During the planning and design phase of the substation or communications facility, floodplain information should be obtained to avoid locating flood-damageable facilities in the 100-year floodplain. If the preferred site is located within a floodplain area, alternative sites must be evaluated and documentation prepared to support a determination of "no practicable alternative" to siting in the floodplain. In addition, steps taken to minimize adverse floodplain impacts should also be documented.
12. Clearing - No construction, dismantling, or forensic activities may clear additional site or right-of-way vegetation or disturb remaining retained vegetation, stumps, or regrowth at locations other than the structure, substation or communication site or access thereto. TVA and the construction, dismantling, or forensic contractor(s) must provide appropriate erosion or sediment controls for areas they have disturbed after each disturbance that have previously been re-stabilized after clearing operations. Control measures shall be implemented as soon as practicable after disturbance in accordance with applicable federal, state, and/or local storm water regulations.
13. Restoration of Site - All construction, dismantling, or forensic related disturbed areas, with the exception of farmland under cultivation and any other areas as may be designated by TVA's specifications, shall be stabilized in the following manner unless the property owner and TVA's engineer specify a different method:
  - A. The subsoil shall be loosened to a minimum depth of 6 inches if possible and worked to remove unnatural ridges and depressions.
  - B. If needed, appropriate soil amendments will be added.
  - C. All disturbed areas will initially be seeded with a temporary ground cover such as winter wheat, rye, or millet, depending on the season. Perennials may also be planted during initial seeding if proper growing conditions exist. Final restoration and final seeding will be performed as line construction is completed. Final seeding will consist of permanent perennial grasses such as those outlined in TVA's "A Guide for Environmental Protection and Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities." Exceptions

would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor.

- D. Rehabilitation species shall use species designated by federal guidance that are low maintenance native species appropriate for the site conditions that prevail at that location.
  - E. TVA holds the option, depending upon the time of year and weather condition, to delay or withdraw the requirement of seeding until more favorable planting conditions are certain. In the meantime, other stabilization techniques must be applied.
  - F. The site must be protected from species designated by the federal Invasive Species Council and must not be the source of species that can be transported to other locations via equipment contaminated with viable materials; thus the equipment must be inspected and any such species material found must be removed and destroyed prior to transport to another location.
14. Air Quality Control - Construction, dismantling, and/or forensic crews shall take appropriate actions to minimize the amount of air pollution created by their operations. All operations must be conducted in a manner which avoids creating a nuisance and prevents damage to lands, crops, dwellings, or persons.
  15. Burning - Before conducting any open burning operations, the contractor and subcontractor(s) shall obtain permits or provide notifications as required to state Forestry offices and/or local fire departments. Burning operations must comply with the requirements of state and local air pollution control and fire authorities and will only be allowed in approved locations and during appropriate hours and weather conditions. If weather conditions such as wind direction or speed change rapidly, the contractor's burning operations may be temporarily stopped by the TVA field engineer.. The debris for burning shall be piled and shall be kept as clean and as dry as possible, then burned in such a manner as to reduce smoke. No materials other than dry wood shall be open burned. The ash and debris shall be buried away from streams or other water sources and shall be in areas coordinated with the property owner on rights-of-way, or project manager for TVA sites.
  16. RENOVATION OR DEMOLITION DEBRIS MAY NOT BE BURNED.
  17. Dust and Mud Control - Construction, dismantling, or forensic activities shall be conducted to minimize the creation of dust. This may require limitations as to types of equipment, allowable speeds, and routes utilized. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used subject to TVA's approval. On new construction sites and easements, the last 100 feet before an access road approaches a county road or highway shall be graveled to prevent transfer of mud on to the public road.
  18. Vehicle Exhaust Emissions - TVA and/or the Contractor(s) and subcontractor(s) shall maintain and operate equipment to limit vehicle exhaust emissions. Equipment and vehicles that show excessive emissions of exhaust gasses and particulates due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective repairs or adjustments are made.

19. Vehicle Servicing - Routine maintenance of personnel vehicles will not be performed on the right-of-way or access route to the site. However, if emergency or "have to" situations arise, minimal/temporary maintenance to personnel vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Heavy equipment will be serviced on the site, except adjacent to or in designated sensitive areas. The Heavy Equipment Department within TVA or the construction, dismantling, or forensic contractor will properly maintain these vehicles with approved spill protection controls and countermeasures. If emergency maintenance in a sensitive or questionable area arises, the area environmental coordinator or construction environmental engineer will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Records of amounts generated shall be provided to TVA. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.
20. Smoke and Odors - TVA and/or the Contractor(s) and subcontractor(s) shall properly store and handle combustible material which could create objectionable smoke, odors, or fumes. The Contractor and subcontractor(s) shall not burn refuse such as trash, rags, tires, plastics, or other debris.
21. Noise Control - TVA and/or the contractor and subcontractor(s) shall take measures to avoid the creation of noise levels that are considered nuisances, safety, or health hazards. Critical areas, including but not limited to residential areas, parks, public use areas, and some ranching operations, will require special considerations. TVA's criteria for determining corrective measures shall be determined by comparing the noise level of the construction, dismantling, or forensic operation to the background noise levels. Also, especially noisy equipment such as helicopters, pile drivers, air hammers, chippers, chain saws, or areas for machine shops, staging, assembly, or blasting may require corrective actions when required by TVA.
22. Noise Suppression - All internal combustion engines shall be properly equipped with mufflers as required by the Department of Labor's "Safety and Health Regulations for Construction." TVA may require spark arresters in addition to mufflers on some engines. Air compressors and other noisy equipment may require sound reducing enclosures in some circumstances.
23. Damages - The movement of construction, dismantling, or forensic crews and equipment shall be conducted in a manner which causes as little intrusion and damage as possible to crops, orchards, woods, wetlands, and other property features and vegetation. The contractor and subcontractor(s) will be responsible for erosion damage caused by his or her actions and employees; and especially for creating conditions that would threaten the stability of the right-of-way or site soil, the structures, or access to either. When property owners prefer the correction of ground cover condition or soil and subsoil problems themselves, the section of the project to so handled shall be documented with an implementation schedule and a property owner signature obtained.
24. Final Site Cleanup and Inspection - The contractor's designated person shall ensure that all construction, dismantling, or forensic related debris, products, materials, and wastes are properly handled, labeled as required and removed from the site. Upon completion of those activities that person and a TVA designated person shall walkdown the site and complete an approval inspection.

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## APPENDIX E – RIGHT-OF-WAY VEGETATION MANAGEMENT

TVA must manage its rights-of-way and easements -to ensure emergency maintenance access; and routine access to structures, switches, conductors, and communications equipment. In addition, TVA must ensure National Electrical Safety Code electrical clearances between structures, tall growing vegetation, and any other structures. Trees located off right-of-way trees that could fall or be cut into a transmission line are also very important.

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

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

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

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

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

In very steep terrain, in sensitive environmental areas, in extensive wetlands, at stream banks and in sensitive property owner land use areas hand clearing may be utilized. Hand clearing is recognized as one of the most hazardous occupations documented by the Occupational Health and Safety Administration. For that reason, TVA is actively looking at better control methods including use of low volume herbicide applications, occasional single tree injections, and tree growth regulators.

TVA does not encourage individual property owner tree reclearing activity because of the high hazard potential of hand clearing; possible interruptions of the line; and, electrical safety considerations for untrained personnel that might do the work. Private property owners may reclear the right-of-way with trained reclearing professionals.

TVA's experience initially was completely with hand clearing. World War II manpower shortages forced TVA to look toward developments in herbicide research. An era of near exclusive use of herbicides existed, then as herbicide prices increased and high volume applications lost favor because of high volume applications and discovery of residue accumulations with many pesticides TVA sought other modes of vegetation control. Farm equipment of greater power and efficiency allowed use of tractor mounted rotary mowers. These mowers not only cut the tall saplings and seedlings on the right-of-way they shatter the stump and the supporting near surface root crown. The tendency of resistant species is to resprout from the root crown and shattered stumps produce a multistem dense stand in the immediate area. Repeated use of the mowers on short cycle reclearing with many original stumps regrowing in the above manner creates a single species thicket or monoculture. With the original large root system and multiple stems the resistant species can and usually does produce regrowth at the rate of 5-10 feet in a year. In years with high rainfall the growth can reach 12-15 feet in a single year.

These created, dense, monoculture stands can become nearly impenetrable for even large tractors. Such stands have low diversity, little wildlife food or nesting potential, and become a property owner concern. They tend to spread off the right-of-way into more desirable species areas. Increasingly, TVA is receiving complaints about the shatter sapling debris density. The potential exists for insect invasion or fungus infection resulting from the easy invasion of damaged specimens or debris. Once started such infestations or invasions can spread into valuable timber of the same or related species off the right-of-way.

Therefore, TVA has been working with universities (such as Mississippi State University, University of Tennessee, Purdue University and others) chemical companies, other utilities, U. S. Department of Transportation, U.S. Fish and Wildlife and U.S. Forest Service personnel to explore other means of dealing with problem vegetation. The results have been strong recommendations to use species specific, low volume, herbicide applications in more situations. Research, demonstrations, and other right-of-way programs show a definite improvement of rights-of-way treated with selective low volume applications of new herbicides using a variety of application techniques and timing.

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

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

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

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

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

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

#### Approved Herbicides for Usage on TVA Rights-of-Way

<u>Trade Name</u>	<u>Active Ingredients</u>	<u>Label Signal Word</u>
Accord	Glyphosate/Liquid	Caution
Arsenal	Imazapyr/Liquid/Granule	Caution
Escort	Metsulfuron Methyl/dry flowable	Caution
Garlon	Triclopyr/Liquid	Caution
Garlon 3A	Triclopyr/Liquid	Danger
Diuron	Diuron/Flowable powder	Caution
Spike 40P	Tebuthiuron/Pellet	Caution
Spike 80W	Tebuthiuron/Wettable powder	Caution

## 500-kV Transmission Line In Middle Tennessee

Transline	Clopyralid/Liquid	Caution
Pathfinder II	Triclopyr/RTU	Caution
Krenite UT	Fosamine Ammonium	Warning
Vanquish	Diglycolamine	Caution

### Approved Herbicides for Bare Ground Areas

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

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

### Approved TGRs for Use on TVA Property

<u>Trade Name</u>	<u>Active Ingredients</u>	<u>Label Signal Word</u>
TGR	Flurprimidol	Caution
Profile 2SC	TGR-paclobutrazol	Caution

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

These herbicides have been evaluated in extensive studies at universities, in support of registration applications and label requirements. Most have been reviewed in the U.S. Forest Service Vegetation Management Environmental Impact Statements and those evaluations are incorporated here by reference. The result of these reviews has been a consistent finding of limited environmental impact beyond that of control of the target vegetation. All the listed herbicides have been found to be of low environmental toxicity when applied by trained applicators following the label and registration procedures, including buffer zones for listed threatened or endangered species.

Those not addressed in the USFS EIS or their supporting research have been peer reviewed in university research, addressed in EPA literature reviews, or are discussed in documents on file at EPA and U.S. Fish and Wildlife Service libraries. On the basis of this

literature and TVA's reviews the approved list above has been compiled and is reviewed again each year as new information is published.

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

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

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

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

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

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

Glyphosate is naturally degraded by microbes in soil and water under both aerobic (with oxygen) and anaerobic (without oxygen) conditions. AMPA is further degraded in soil and sediments to: phosphorus, nitrogen, hydrogen and carbon dioxide. Glyphosate binds rapidly and completely to a wide range of soils and sediment when introduced into the environment. This essentially eliminates movement in the soil. The average half-life of glyphosate in soils is less than 45 days. Half-life for the dissipation of glyphosate in environmental waters ranges from 1.5 to 14 days.

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

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

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

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

## **APPENDIX F – TVA TRANSMISSION CONSTRUCTION GUIDELINES NEAR STREAMS**

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

### **Three Levels of Protection**

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

#### **A) Standard Stream Protection**

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

#### **Guidelines:**

1. All construction work around streams will be done using pertinent Best Management Practices (BMPs) such as those described in “A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities,” especially Chapter 6, Standards and Specifications.
2. All equipment crossings of streams must comply with appropriate state permitting requirements. Crossings of all drainage channels, intermittent streams, and permanent streams must be done in ways that avoid erosion problems and long-term changes in water flow. Crossings of any permanent streams must allow for natural movement of fish and other aquatic life.
3. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g. a feller-buncher) that would result in minimal soil disturbance and damage to low lying vegetation. The method will be selected based on site specific conditions and topography to minimize soil

disturbance and impacts to the SMZ and surrounding area. Stumps can be cut close to ground level but must not be removed or uprooted.

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

## **B) Protection of Important Permanent Streams**

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

### **Guidelines:**

1. Except as modified by guidelines 2-4 below, all construction work around streams will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, Standards and Specifications.
2. All equipment crossings of streams must comply with appropriate state (and, at times, federal) permitting requirements. Crossings of drainage channels and intermittent streams must be done in ways that avoid erosion problems and long-term changes in water flow. Proposed crossings of permanent streams must be discussed in advance with Resource Stewardship staff and may require an on-site planning session before any work begins. The purpose of these discussions will be to minimize the number of crossings and their impact on the important resources in the streams.
3. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g. a feller-buncher) that would result in minimal soil disturbance and damage to low lying vegetation. The method will be selected based on site specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. Cutting of trees near permanent streams must be limited to those required to meet National Electric Safety Code (NESC) and danger tree requirements. Stumps can be cut close to ground level but must not be removed or uprooted
4. Other vegetation near streams must be disturbed as little as possible during construction. Soil displacement by the actions of plowing, discing, blading or other tillage or grading equipment will not be allowed in SMZs, however, a minimal amount of soil disturbance may occur as a result of clearing operations. Shorelines that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible.

## **C) Protection of Unique Habitats**

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

**Guidelines:**

1. Except as modified by guidelines 2-4 below, all construction work around the unique habitat will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, Standards and Specifications.
2. All construction activity in and within 30 meters (100 feet) of the unique habitat must be approved in advance by Resource Stewardship staff, preferably as a result of an on-site planning session. The purpose of this review and approval will be to minimize impacts on the unique habitat. All crossings of streams also must comply with appropriate state (and, at times, federal) permitting requirements.
3. Cutting of trees within 30 meters (100 feet) of the unique habitat must be discussed in advance with Resource Stewardship staff, preferably during the on-site planning session. Cutting of trees near the unique habitat must be kept to an absolute minimum. Stumps must not be removed, uprooted, or cut shorter than one foot above the ground line.
4. Other vegetation near the unique habitat must be disturbed as little as possible during construction. The soil must not be disturbed by plowing, discing, blading, or grading. Areas that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible, in some cases with specific kinds of native plants. These and other vegetative requirements will be coordinated with Resource Stewardship staff.

**Additional Help**

If you have any questions about the purpose of these guidelines or how to apply them, please contact your supervisor or the Environmental Coordinator in the local Transmission Service Center.



# APPENDIX G – TVA WETLANDS RAPID ASSESSMENT METHOD (TVARAM) FIELD DATA SHEET

**TVARAM Field Form Quantitative Rating**

<b>Site:</b>	<b>Rater(s):</b>	<b>Date:</b>
--------------	------------------	--------------

max. 6 pts.	subtotal

### Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- >50 acres (>20.2 ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

max. 14 pts.	subtotal

### Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (> 10 years), shrubland, young 2nd growth forest (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- High. Urban, industrial, open pasture, row cropping, mining, construction (1)

max. 30 pts.	subtotal

### Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3) [BR/CM (5)]
- Precipitation (1) [unless BR/CM primary source (5)]
- Seasonal/intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- 100-year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g., forest), complex (1)
- Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- >7 m (27.6 in.) (3)
- 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3) [BR/CM (4)]
- Seasonally inundated (2) [BR/CM (4)]
- Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

<input type="checkbox"/> ditch	<input type="checkbox"/> point source (nonstormwater)
<input type="checkbox"/> tile (including culvert)	<input type="checkbox"/> filling/grading
<input type="checkbox"/> dike	<input type="checkbox"/> road bed/RR track
<input type="checkbox"/> weir	<input type="checkbox"/> dredging
<input type="checkbox"/> stormwater input	<input type="checkbox"/> other _____

max. 20 pts.	subtotal

### Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

<input type="checkbox"/> mowing	<input type="checkbox"/> shrub/sapling removal
<input type="checkbox"/> grazing	<input type="checkbox"/> herbaceous/aquatic bed removal
<input type="checkbox"/> clearcutting	<input type="checkbox"/> woody debris removal
<input type="checkbox"/> selective cutting	<input type="checkbox"/> sedimentation
<input type="checkbox"/> farming	<input type="checkbox"/> dredging
<input type="checkbox"/> toxic pollutants	<input type="checkbox"/> nutrient enrichment

subtotal this page

Last revised 2005-03-10

TVARAM Field Form Quantitative Rating

Site:	Rater(s):	Date:
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submit previous page

max 10 pts submit

### Metric 5. Special Wetlands

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- Bog fen, wet prairie (10), acidophilic veg., mossy substrate >10 sq m, sphagnum or other moss (5), musk, organic soil layer (3)
- Kassic forest (wet, flr or ad), upland incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- Sensitive geologic feature such as spring/leak, sink, losing/underground stream, cave, waterfall, rock outcrop (3)
- Vernal pool (3), isolated, perched, or slope wetland (4); headwater wetland (1st order perennial or above) (3)
- Island wetland <0.1 acre (0.04 ha) in reservoir, river, or perennial water >0.5 (2 m) deep (5)
- Braided channel or floodplain/terrace depressions (foodplain pool, slough, seep, meander scar, etc.) (3)
- Grass morph. adapt. in >5 trees >10 in. (25 cm) dbh buttress, multitrunked, stilted, shallow root/rip-up, or pneumatophores (3)
- Ecological community with global rank (NatureServe): G1\*(10), G2\*(3), G3\*(3) [use higher rank where mixed rank or qualifier]
- Known occurrence state/federal threatened/endangered species (10), other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- Superior/enhanced habitat/use: migratory songbird/waterfowl (5), in-reservoir buttonbush (4), other fish/wildlife management/designation (2)
- Cat. 1 (very low quality) < 1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mineral/acidated land (10)

max 20 pts submit

### Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities. Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Muckflats
- Open water <20 acres (8 ha)
- Moss/lichen, Other \_\_\_\_\_

#### Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre [if for BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion. Select only one

- High (5)
- Moderately high (4) [BR/CM (5)]
- Moderate (3) [BR/CM (5)]
- Moderately low (2) [BR/CM (3)]
- Low (1) [BR/CM (2)]
- None (0)

#### Narrative Description of Vegetation Quality

- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always the presence of rare, threatened, or endangered species

6c. Coverage of invasive plants. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

#### Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [if for BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography. Score all present using 0 to 3 scale.

- Vegetated hummocks/buzzocks
- Coarse woody debris >15 cm (6 in.)
- Standing dead >25 cm (10 in.) dbh
- Amphibian breeding pools

#### Hypothetical Wetland for Estimating Degree of Interspersion



#### Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

## GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.tx.us/baw/021/021.html>

## APPENDIX H – DEMAND-SIDE MANAGEMENT EFFORTS

TVA has a strong track record in promoting and demonstrating the wise use of energy. TVA and the distributors of TVA power have pursued such programs as part of their role as leaders in public power, and are continuing to explore opportunities to expand energy conservation through demand-side management efforts. From 1997 to 2005, TVA programs have yielded a cumulative peak demand reduction of approximately 440 MW.

These programs include:

- *energy right*<sup>®</sup>, Energy Services Company, and geothermal heat pump programs.
- On-site energy consulting with directly served customers, such as GM's Saturn Plant.
- Energy audits and educational activities.

Among the most successful programs is the *energy right* Residential Program launched in 1996. By 2000, this program achieved approximately 150 MW of peak load reduction. These initiatives promote high efficiency heating, ventilating, and air-conditioning (HVAC) systems, better thermal envelopes, and other measures that save energy and reduce peak demand. The impacts from these programs are expected to grow steadily with continued annual participation.

In addition, the Direct Load Control (DLC) program provides approximately 50 MW of peak load reduction yearly through the cycling of residential water heaters and air conditioners by radio signal. This program offers Middle Tennessee homeowners incentives in return for allowing their appliances to be switched off remotely for short periods during peak loads. Such programs offer significant potential for energy management.

### Program Descriptions

The following sections provide brief explanations of the programs which contribute to TVA's energy efficiency measures.

#### a) *energy right* Programs

- **Residential Heat Pump Retrofit Program** - promotes quality installations of higher efficiency heat pumps by members of the Quality Contractor Network (QCN).
- **Residential New Homes Program** - promotes higher efficiency thermal envelope standards and quality construction in new homes and the installation of energy efficient heat pumps. Provides training for home builders and trade allies to ensure proper installation of energy efficiency measures.
- **Residential Manufactured Homes Program** - focuses on achieving improvements in the HVAC and thermal envelope components of manufactured housing. Program requires that the home be equipped with an energy efficient heat pump.

- **Student Audit** - provides students with a package to fill out and conduct home audit. Students return the audit to the school for analysis and recommendations are made for energy efficiency implementation measures.

Recent results of the energy right program, as well as of Direct Load Control, are summarized in Table H-1.

**Table H-1. *energy right* Installations and Direct Load Control in the Middle Tennessee area, April 2004 – April 2005.**

	Units Installed	kW Demand Reduction
Water Heaters	1444	11552
New Manufactured Homes	58	647
Heat Pump Installations	714	10910
Single Family New Homes	1282	381522
Multi-Family New Homes	43	14
School Self-Audit Program	285	798
<b>Totals</b>	<b>3826</b>	<b>62073</b>
<i>energy right</i> Total		62 MW Reduction
Direct Load Control		50 MW Reduction
<b>Total, Current Programs</b>		<b>112 MW Reduction</b>

#### **b) Energy Services Company**

A popular TVA/Power Distributor program is the Energy Services Company, a consulting service for schools, local government, businesses, and industries. This program lowers the customer's energy use, making businesses more competitive and helping TVA reduce peak loads on its power system. It provides technical expertise, turn-key project implementation and management, and third-party financing to assist commercial and industrial customers with energy efficiency upgrades and operational improvements. There are currently six projects completed or underway in the Middle Tennessee area.

#### **c) Large Commercial and Industrial Services**

The Large Commercial program works to improve the efficiency and reduce the owning and operating costs of schools, restaurants, and other large commercial facilities. The Industrial Services program develops energy solutions to industrial, environmental, productivity, and product process quality problems for Valley industries. Some examples are:

- **Commercial Geothermal Heat Pump Program** - Through a combination of offerings, including geothermal heat pump installations, the Large Commercial program has successfully reduced energy consumption for hundreds of businesses and schools throughout the region. TVA/Power Distributor support for geothermal heat pumps has been instrumental in implementing this energy efficient technology throughout the region. During the last 10 years, TVA has helped owners, architects

and engineers apply geothermal heat pumps on 218 commercial building projects, most of them schools.

In the areas served by Cumberland Electric Membership Corporation, Clarksville Department of Electricity, Nashville Electric Service, Gallatin Department of Electricity, Middle Tennessee Electric Membership Corporation, and Dickson Electric Department, TVA has assisted 47 geothermal heat pump projects including 32 schools, 8 government buildings, 5 healthcare projects, one office building and one church. The use of geothermal heat pumps on these projects instead of conventional heating and cooling technology is expected to reduce summer peak demand by approximately 2.5 MW.

- **Energy Management Assistance** - TVA has partnered with General Motors to assist with energy conservation at GM's Saturn Plant in Spring Hill, Tennessee. Since 1998, a TVA specialist has been located onsite to help plant personnel develop and implement a comprehensive energy management program. TVA has assisted through a variety of services to significantly reduce the electric demand and energy usage, as well as natural gas and compressed air usage. Efforts have included lighting and compressed air leak studies, energy audits, electric, natural gas and compressed air demand monitoring and charting. Actual conservation and demand reduction achievements have not been released by GM.

#### **d) Energy Audits**

TVA provides energy audits through a distributor partnership program. This partnership initiative brings TVA engineering and technical resources to commercial and industrial customers. The program surveys energy use patterns and recommends energy efficiency improvements in numerous areas, but information is not available on actual implementation.

#### **Other Initiatives**

In Fiscal Year 2002 Pacific Energy Associates (PEA) was contracted by TVA to assess a number of demand-side management (DSM) options that could achieve up to 250 MW of peak demand reduction in a two-year period. The assumptions and findings of this study were applied to the Middle Tennessee area in order to determine load reduction potential in the area served by the proposed 500-kV transmission line. Table H-2 includes the findings of the original study, as well as a percentage applied to the affected service area based on the original assumptions of the study.

**Table H-2. Findings of Pacific Energy Associates (PEA) Study of Load Reduction Potential for the Entire TVA Service Area and the Middle Tennessee Service Area**

	Assumptions, PEA Study, entire TVA service area <sup>1</sup>	Actual, Middle TN service area <sup>2</sup>	% TVA service area in Middle TN area
Residential Customers	3,547,242	585,418	16.5%
Commercial and Industrial Customers			
<50KW	558,749	69,482	12.4%
>50KW	62,796	11,689	18.6%
>5,000KW	476	41	8.6%
	Potential load reduction for entire TVA service area <sup>3</sup>	Potential load reduction for Middle TN service area <sup>4</sup>	
Average MW	92	17.6	
Peak MW	187	36.5	

<sup>1</sup> Source: Total Valley distribution, June 2002; may be slightly higher than numbers reported to PEA

<sup>2</sup> Source: 2002 TVPPA Membership Directory; data compiled in October 2001 distributor survey

<sup>3</sup> Actual data from PEA Report FY02

<sup>4</sup> Extrapolated using percentage of actual customers

## APPENDIX J – NOISE DURING TRANSMISSION LINE 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 Environmental Protection Agency (EPA) and the Department of Housing and Urban Development (HUD) have established noise guidelines. EPA guidelines are based on an equivalent sound level day/night (DNL) which is a 24-hour average sound level with 10 dB added to hours between 10 PM and 7 AM since people are more sensitive to nighttime noise. EPA recommends a guideline of DNL less than 50 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 EPA 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 gives consideration to the Federal Interagency Committee on Noise (FICON 1992) recommendation that a 3 dB increase indicates possible impact, requiring further analysis when the existing DNS 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 J-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 J-1. Estimated annoyance from background noise (FICON 1992).**

Day/Night Level (dBA)	Percent Highly Annoyed	Average Community Reaction
75 & above	37	Very severe
70	25	Severe
65	15	Significant
60	9	Moderate
55 & 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 in order 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 are described in Section 2.1.1. Maximum noise levels generated by the various pieces of construction equipment typically range from about 70 to 85 dBA (Bolt, Beranek and Newman 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 a reference distance of 50 feet from the noise source, equivalent noise levels for the various phases of construction activity range from about 76 to 85 dBA without use of track drills. With use of track drills, which is not expected to be widespread, equivalent noise levels for the road construction and foundation installation phases would increase from 84 or 85 dBA to 94 dBA. Helicopter noise and noise from blasting could exceed these noise levels.

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 1000 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 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 would be limited to a few periods of a few days each. These measures 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 also affected by weather. It occurs during all types of weather when air ionizes near irregularities such as nicks, scrapes, dirt, 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.