

Chapter 1 – PURPOSE, NEED, AND BACKGROUND FOR THE PROPOSED ACTION

1.1 Purpose and Need for the Proposed Action

The U.S. Environmental Protection Agency (USEPA) finalized the Mercury and Air Toxics Standards (MATS) rule, which requires the application of maximum achievable control technology (MACT) standards to reduce air pollutants from power plants. Utilities have until April 16, 2015 to install the new air pollution controls to comply with the rule (USEPA 2012). However, utilities may request, and states may grant, up to one extra year to install the new controls or replace sources. USEPA has also tightened the National Ambient Air Quality Standards (NAAQS) and taken other regulatory actions, resulting in emissions reductions at coal-fired power plants through 2020.

The USEPA and the Tennessee Valley Authority (TVA) executed a Federal Facilities Compliance Agreement (FFCA), also referred as Compliance Agreement or the Agreement, on April 14, 2011 (USEPA 2011a). TVA also entered into a consent decree with the States of Alabama, Kentucky, Tennessee, and North Carolina and three environmental advocacy groups, the Sierra Club, the National Parks Conservation Association, and Our Children’s Earth Foundation (USEPA 2011b). The FFCA and the consent decree are substantively identical and references to the FFCA in this document include the consent decree and its parties.

In order to comply with the FFCA, the Utility MATS, and other anticipated regulations, TVA proposes to install and operate emission controls at Gallatin Fossil plant (GAF), which is located near the city of Gallatin in Sumner County, Tennessee (Figure 1-1). Installing the emissions controls would allow continued operation of GAF’s four coal-fired generating units, providing a reliable energy source for the region. This also would be consistent with TVA’s 2011 Integrated Resource Plan (IRP) and help TVA achieve a more balanced portfolio of energy resources on the TVA system.

The FFCA resolved disputes over how the Clean Air Act’s (CAA) New Source Review (NSR) program applied to TVA’s power plant maintenance activities. As part of this resolution, the FFCA requires TVA to reduce emissions at GAF through one of the three specified methods—installing additional emissions controls to allow continued operation of the coal-fired units, repowering to combust renewable biomass, or retirement—no later than December 31, 2017. TVA had discretion to reduce emissions by installing controls on those units (i.e., scrubbers and/or selective catalytic reduction [SCR] technology), by converting the units to biomass, or by retiring the units by specified dates.

Installation of Emission Control Equipment and Associated Facilities, Gallatin Fossil Plant

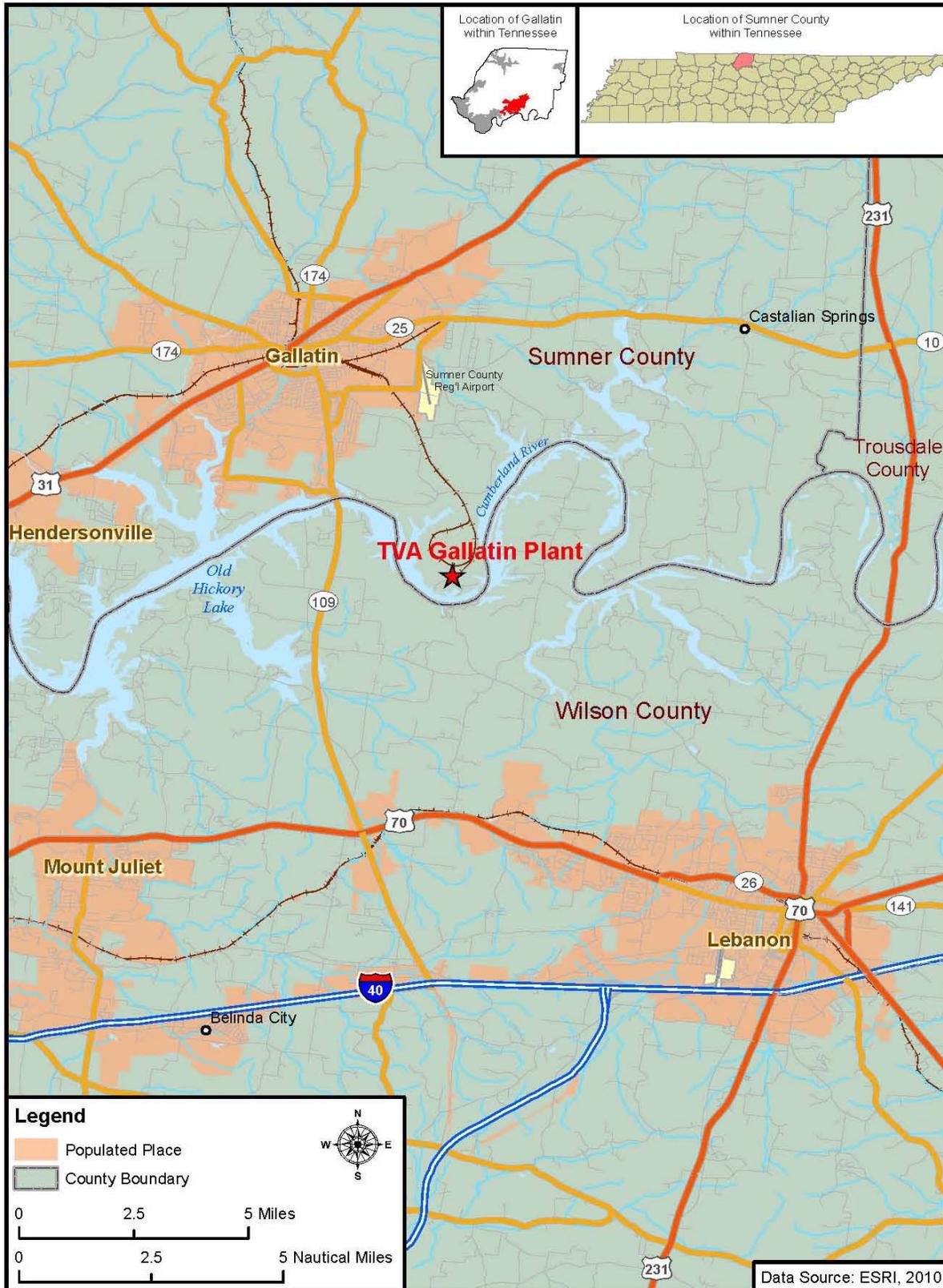


Figure 1-1. Location of Gallatin Fossil Plant

Specifically, TVA proposes to install and operate, as necessary, the following at GAF:

- Dry flue gas desulfurization (dry FGD) system or “dry scrubber” to reduce sulfur dioxide (SO₂) emissions.
- SCR technology to reduce nitrogen oxide (NO_x) emissions.
- Activated carbon injection (ACI) system integrated with the dry FGD to reduce mercury emissions.
- Pulse jet fabric filter (baghouses or PJFF) to control particulate matter (PM) emissions.

Additional facilities required to support TVA’s proposed action include a new on-site dry coal combustion product (CCP) landfill; electrical transmission lines (TLs), transformer yard, and switchyard upgrades; and ancillary facilities such as on-site haul roads. TVA’s plans for closure of surface impoundments to support wet-to-dry conversion plans specific to GAF are not included in the scope of this environmental assessment (EA).

1.2 Background

TVA began construction of GAF in 1953 and operations began in 1959. GAF’s powerhouse, coal yard, CCP storage, and additional facilities are located along the north bank of the Cumberland River (see Figure 1-2). GAF operates four coal-fired, steam-generating units and combusts an average of 12,350 tons of coal per day. Units 1 and 2 each have generator nameplate ratings of 300 megawatts (MW), and Units 3 and 4 each have generator nameplate ratings of 327.6 MW. In a typical year, GAF generates about seven billion kilowatt-hours (kWh) of electricity, enough to supply about 480,000 homes. Four fuel-oil combustion-turbine (CT) units were added to GAF in the early 1970s, and another four added in 2000. The CT units support GAF’s peak energy demand.

TVA has installed electrostatic precipitators (ESPs) at GAF to reduce PM emissions and low-NO_x burners to reduce NO_x emissions. TVA also burns a low-sulfur blend coal, primarily from the Powder River Basin (PRB), at GAF to reduce emissions of SO₂. Currently, approximately 185,000 dry tons of fly ash and approximately 45,000 dry tons of bottom ash are wet-slucied to GAF’s surface impoundments each year. TVA has proposed dry CCP operations for the fly ash and dry FGD byproduct as part of the proposed action; activities to support bottom ash wet-to-dry conversion are not included in the scope of this EA. Figure 1-2 shows the GAF powerhouse, Cumberland River Aquatic Center (CRAC) facility, combustion turbines, current coal pile area, and CCP (fly ash and bottom ash) storage area at GAF.

The GAF reservation also supports non-power-related land uses, such as the Tennessee Wildlife Resources Agency (TWRA) wildlife management areas (WMA) designated for recreational/hunting uses and the CRAC. The CRAC is an aquatic hatchery operated by the TWRA on TVA lands; a 7-acre site on the north side of GAF’s discharge channel on Cumberland River mile (RM) 242.4. The TVA and TWRA currently participate in a License Agreement to support CRAC facility operations. TVA’s responsibilities are limited to providing land for the CRAC buildings, funds to subsidize operations, and water used at the hatchery comes off the GAF raw water header in the plant’s discharge channel. The TWRA is responsible for CRAC facility operations, which include freshwater mussel holding and propagation.



Figure 1-2. Gallatin Fossil Plant Existing Facilities

TVA's plans for closure of surface impoundments to support wet-to-dry conversion plans specific to GAF are not included in the scope of this EA. Bottom ash will continue to be wet-sluiced until a separate dewatering project is proposed. Likewise, ash pond closure would be designed and implemented as required in GAF's National Pollutant Discharge Elimination System (NPDES) Permit TN0005428 (TDEC 2012b) with the approval of the Tennessee Department of Environment and Conservation (TDEC) Division of Water Pollution Control at a future date.

1.3 Decisions to be Made

The decision before TVA is whether to install the pollution control equipment at GAF to meet the requirements of the FFCA and other applicable regulatory requirements, in order to continue operating GAF's coal-fired units beyond 2017. The decision before TVA includes whether to undertake the following actions:

- Install and operate lime-based dry FGD systems for GAF Units 1-4, including associated pebble lime and byproduct storage facilities.
- Install and operate SCR for GAF Units 1-4, including an ammonia storage facility.
- Integrate ACI and PJFF systems with the dry FGD installation process.
- Install and operate a dry CCP disposal facility to support pollution control equipment and plant operations.
- Install and operate ancillary facilities, such as the electrical feeds, TLs, and transformer yard, to support clean air equipment operations.

TVA's decision to install pollution control equipment must also include which dry FGD configuration would be implemented:

- Across Discharge Channel Configuration (install and operate dry FGD across the discharge channel, SCR adjacent to the GAF powerhouse, and CCP disposal) or
- Close Coupled Configuration (install and operate dry FGD and SCR adjacent to the GAF powerhouse, and CCP disposal).

If Alternative 2 (Across Discharge Channel Configuration) is selected by TVA, the TWRA CRAC hatchery must be removed from its current location to avoid land use conflicts. As TVA does not control the CRAC hatchery operations, activities to be implemented by TWRA related to removing and potentially relocating the structures to a new site to allow for continued operations would be the sole responsibility of the TWRA. Therefore, TWRA's plans for CRAC relocation are speculative and are not included in the scope of this EA. TVA assumes all applicable requirements would be adhered to by the TWRA, assuring species are protected and impacts are avoided.

1.4 Related Environmental Reviews

In 2011, TVA completed the IRP to detail how TVA would meet the electric power demands in its service area for the next 20 years while fulfilling its mission of providing low-cost, reliable power; environmental stewardship; and economic development (TVA 2011a). TVA released the accompanying *Environmental Impact Statement (EIS) for TVA's Integrated Resource Plan*:

TVA's *Environmental & Energy Future* in March 2011 (TVA 2011b). This EA tiers from the 2011 EIS for TVA's IRP by providing a detailed analysis of the potential impacts of installing air pollution control equipment on one of TVA's major coal-fired generating plants. In addition, the environmental reviews below are relevant to this EA and are hereby incorporated by reference:

- *Paradise Fossil Plant Units 1, 2, and 3, Selective Catalytic Reduction Systems for Nitrogen Oxide Control Final Environmental Assessment* (TVA 1999)
- *Bull Run Fossil Plant Unit 1, Selective Catalytic Reduction Systems for Nitrogen Oxide Control Final Environmental Assessment* (TVA 2002a)
- *Installation of Flue Gas Desulfurization System on Paradise Fossil Plant Unit 3, Muhlenberg County, Kentucky, Final Environmental Assessment*, March 2003 (TVA 2003b)
- *Replacement or Rejuvenation of Catalyst for Selective Catalytic Reduction for Nitrogen Oxides at Seven TVA Fossil Plants in the Tennessee Valley, Final Environmental Assessment and Finding of No Significant Impact*, January 2005 (TVA 2005a)
- *Installation of Flue Gas Desulfurization System on Bull Run Fossil Plant, Anderson County, Tennessee, Final Environmental Assessment*, March 2005 (TVA 2005b)
- *Installation of Flue Gas Desulfurization System on Kingston Fossil Plant, Roane County, Tennessee, Final Environmental Assessment*, April 2006 (TVA 2006a)
- *Operational Improvements to Optimize Selective Catalytic Reduction Systems at Five Fossil Plants Tennessee, Alabama, and Kentucky, Environmental Assessment and Finding of No Significant Impact*, April 2008 (TVA 2008)

1.5 Scope of the Environmental Assessment

TVA has prepared this EA to comply with the National Environmental Policy Act of 1969 (NEPA) and associated implementing regulations, and to provide a method for members of the public to comment on TVA's proposed action and alternatives. TVA considered the possible environmental effects of the proposed action and determined that potential effects to the environmental resources listed below are relevant to the decision to be made. Thus, potential effects to the following environmental resources are addressed in detail in this EA:

- Air quality and climate change
- Water resources (surface water, groundwater, floodplains)
- Biological resources (aquatics, vegetation, natural areas, terrestrial animals, and wetlands)
- Cultural and historic resources
- Geology, soils, and prime farmland
- Solid waste and utilities
- Socioeconomics and environmental justice
- Land use and recreation

- Aesthetics and visual resources
- Hazardous materials and waste
- Noise
- Public health and safety
- Transportation

1.6 Public and Agency Involvement

TVA is making this draft EA available for a 30-day public review period. It plans to publish a notice of availability in two newspapers that serve the Sumner County area: *The Tennessean* and the *Gallatin News Examiner*. In addition, the draft EA will be published on TVA's NEPA website. TVA also will send copies of the draft EA to the Gallatin Public Library, TDEC, the U.S. Fish and Wildlife Service (USFWS), the State Historic Preservation Officer (SHPO), the National Park Service (NPS), and TWRA for review and comment. Individuals and organizations who had previously expressed an interest in the proposed action will also be notified of the availability of the EA (refer to Chapter 6 for the list of agency's TVA submitted copies).

This proposal was reviewed in accordance with Executive Order (EO) 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), the Farmland Protection Policy Act of 1981, the National Historic Preservation Act of 1966 (NHPA), the Endangered Species Act of 1973 (ESA), Section 404 of the Clean Water Act of 1972 (CWA), and EO 12372 (Intergovernmental Review).

1.7 Environmental Permits Required

To an extent, this draft EA covers issues and information relevant to agencies with permitting authority for the project, such as the U.S. Army Corps of Engineers (USACE), and respective state agencies. TVA would obtain all permits and complete permit-required plans that are necessary to implement the proposed action. These could be the following:

- New Solid Waste Class II Disposal Permit for the disposal of residuals from operating additional pollution control equipment and the four generating units. This permit would contain applicable groundwater protection measures.
- TDEC Aquatic Resource Alteration Permit (ARAP) for physical alteration of surface waters of the state (streams, wetlands, reservoirs, etc.).
- Air construction permit for new emissions sources.
- Modification of the GAF's existing air operating permits to reflect the new plant configuration and associated emissions.
- NPDES Construction Storm Water Permit for storm water runoff from construction activities.
- Modification of GAF's existing NPDES permit for the plant to reflect the new plant configuration and any discharges associated with industrial activities.
- A USACE Section 404 and Section 10 permit.

- Modifications to the Integrated Pollution Prevention Plan (IPPP) would be made for the addition of new surface ponds, switchyards, and fuel tanks.
- A Risk Management Plan (RMP) would be developed for the addition of new ammonia handling facilities required for SCR operations.
- Modification to the Tennessee Multi-sector Permit for Industrial Storm Water discharges would be made for the addition of new storm water outfalls.
- Hydrostatic testing permit application would be submitted if necessary for pipe system integrity testing.
- The GAF site Storm Water Pollution Prevention Plan (SWPPP) would be revised to include management of precipitation into secondary containment for ammonia tanks.

1.8 Project-Specific Design Measures and Environmental Commitments

To ensure compliance during construction and operation of all components, TVA would implement the project design measures, best management practices (BMPs), and environmental commitments summarized below, as necessary. Refer to Chapter 4 for additional information regarding project specific mitigation measures.

1.8.1 Proposed Action Construction

- Appropriate BMPs for erosion control and stabilization of disturbed areas, including dust suppression, would be utilized, and all construction activities would be conducted in a manner to ensure that waste materials are contained and that introduction of polluting materials into receiving waters is minimized.
- Specific haul roads will be paved, as required, to ensure no particulate emissions are conveyed past the GAF property boundary.
- In addition to the proper operation of pollution control devices and dust suppression methods for controlling fugitive emissions as required by the TDEC air operating permit, the following mitigation measures are being considered for maintaining air quality:
 - If necessary, emissions from construction areas, paved, and unpaved roads would be mitigated using wet suppression. From roadways and unpaved areas, wet suppression can reduce fugitive dust emissions by as much as 95 percent.
 - Specific haul roads would be paved, as required, to ensure no particulate emissions associated with industrial activity are past the GAF property boundary.
 - All applicable permits, as described in Section 1.7, would be acquired. Consequently, associated permit-related mitigations and BMPs, determined at the time of the permitting process, would be implemented to further minimize impacts to water quality and wetlands.
 - TVA would notify the USACE and TWRA within 30 days of planned construction start-up date(s) to reduce possible land-use conflicts.
 - TVA would ensure construction activities for areas that support Indiana bat

habitat are performed in a manner to avoid conflicts and protect breeding habitat. TVA would notify USFWS prior to clearing/construction of proposed project areas supporting Indiana bat habitat, and remove trees that support Indiana bats during winter months only (outside of the maternity period).

- Protective buffers around historic cemeteries and archeological sites potentially eligible for listing on the National Register of Historic Places (NRHP) have been identified, flagged, and noted on project plans to ensure such sites are avoided during all phases of TVA's proposed action.
- In consultation with the SHPO and interested federally recognized Indian tribes, TVA is developing a Programmatic Agreement (PA) to be signed by TVA and the SHPO. The PA specifies stipulations for the avoidance, minimization, and mitigation of adverse effects to NRHP-eligible properties resulting from the construction, operation, and maintenance of emissions control equipment and CCP disposal facilities and associated infrastructure. If, after avoidance measures for a historic cemetery have been considered in consultation with the SHPO and found not to be technically feasible or economically prudent, TVA would follow procedures outlined in Tennessee Code Title 46 Chapter 4 – Termination of Use of Land as Cemetery.
- Mitigations and BMPs for soil erosion would be developed as part of the legally required SWPPP Erosion Control Plan. All erosion and sediment controls would be installed, placed, implemented, or constructed in accordance with the provisions of the *Tennessee Erosion and Sediment Control Handbook*.
- Appropriate management of construction and land-clearing debris, including recycling and reuse when possible, would limit solid waste generation and disposal needs.
- Proper management of hazardous materials/wastes would be conducted in accordance with established TVA procedures. TVA would comply with all TDEC regulations regarding disposal of waste materials, including asbestos and lead-based paint (LBP) management activities prior to demolition.
- TVA would develop a detailed blasting plan to protect workers and nearby neighbors. The plan would document the specifications or rules that clearly define the performance and safety requirements of the work. The plan would also delineate proper hearing protection for workers in the vicinity of the blast and would ensure that the use, transportation, and storage of explosives is being conducted in accordance with all applicable regulations, including 29 Code of Federal Regulations (CFR) 1926.900, *Blasting and the Use of Explosives*; 49 CFR Parts 171-179, *Highways and Railways*, and 49 CFR Parts 390-397, *Motor Carriers* (transportation); and 27 CFR Part 55, *Commerce in Explosives* (storage).
- The need to implement mitigations to alleviate traffic impacts would be identified through coordination with the Tennessee Department of Transportation (TDOT), the Sumner County Highway Department, and the City of Gallatin.

1.8.2 Proposed Action Design and Operations

Clean Air Equipment

- TVA's recommended coal quality and specification testing would be performed, as required.
- Appropriate quality assurance activities related to continuous stack monitoring would be performed, as required, by continuous emission monitoring systems (CEMS) per CAA Title IV (Acid Rain) provisions.
- Stack paint and lighting patterns and requirements would be consistent with Federal Aviation Administration (FAA) regulation AC 70/7460 (FAA 2007).

Ammonia Facilities

- The spill retention basin would be sized to retain the contents of an entire tank, deluge water and storm water. The spill retention basin at a minimum would be lined with compacted in situ earth or low-permeability clay liner.
- TVA would monitor impacts on effluent pH; outfall parameters would be evaluated and adjusted as necessary to meet NPDES permit requirements.
- TVA would develop an RMP describing the overall management structure, all risks, and all physical and operational methods designed to minimize the likelihood of an accidental ammonia release.

CCP Hauling and Storage

- TVA would monitor impacts from ammonia addition on dry CCP and associated runoff during rain events; CCP would be evaluated to determine optimum means of ensuring that adequate mixing and assimilation of ammonia compounds occur within the landfill. This will be performed by periodic measuring the ammonia-on-ash concentration to ensure that it does not exceed 118 parts per million (ppm), calculated to be the threshold TVA would implement to meet the requirements of TDEC and the USFWS).
- TVA would ensure the maximum area of exposed ash at any particular time during the stacking period does not exceed 10 acres (4.05 hectares).