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# TVA GALLATIN FOSSIL PLANT BORROW SITE FINAL ENVIRONMENTAL ASSESSMENT

Sumner County, Tennessee

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# Summary

TVA is proposing to develop a site ("borrow site") on land it owns northwest of the Gallatin Fossil Plant (GAF). The soil at the proposed borrow site is needed for current and future operations and maintenance activities at GAF. Such activities may include minor erosion repair, site grading, drainage improvements, ash impoundment closure projects, landfill development projects, access road improvements and other general maintenance projects for existing facilities. If and when such actions are undertaken, they will receive separate NEPA review.

Alternative B best fits the project's purpose and need, as well as TVA's anticipated conversion to dry storage of CCR material produced at GAF, both now and in the future, as well as permanent disposal of previously produced CCR. This option would minimize the number of public roads impacted by moving the soil to GAF from the borrow site, thus reducing the potential long-term environmental impacts from air and noise emissions, associated long-term safety risks, and potential traffic issues caused by trucks hauling soil from a source further away.

This Environmental Assessment allows for public and agency review and input. Notice is made of the report's availability through newspaper notices in local papers, news releases to the media, email notices and posting on TVA's web site.

This report evaluates the potential environmental impacts for developing a borrow site and the different alternatives considered, including potential impacts resulting from taking no action.

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# Symbols, Acronyms, and Abbreviations

AADT	Annual Average Daily Traffic		
ACS	American Community Survey		
APE	Area of Potential Effect		
ARAP	Aquatic Resources Alteration Permit		
BMP	Best Management Practices		
CAA	Clean Air Act		
CFR	Code of Federal Regulations		
cfs	Cubic Feet Per Second		
CCR	Coal Combustion Residuals		
CEQ	Council on Environmental Quality		
CO	Carbon Monoxide		
	Carbon Dioxide		
CRM	Cumberland River Mile		
CT	Combustion Turbine		
CWA	Clean Water Act		
dB	Decibel(s)		
dBΔ	A-Scale Weighting Decibels		
FA	Environmental Assessment		
EJ	Environmental Justice		
FO	Executive Order		
EPA	U.S. Environmental Protection Agency		
ESA	Endangered Species Act		
FPPA	Farmland Protection Policy Act		
FSA	Endangered Species Act		
FHWA	Federal Highway Department		
GAF	Gallatin Fossil Plant		
GHG	Greenhouse Gases		
HUC	Hydrologic Unit Code		
HUD	U.S. Department of Housing and Urban Development		
Ldn	Day-Night Sound Level		
LOS	Levels of Service		
ma/L	Milligrams Per Liter		
msl	Mean Sea Level		
NAAQS	National Ambient Air Quality Standards		
NEPA	National Environmental Policy Ac		
NHPA	National Historic Preservation Act		
NLEB	Northern Long-Eared Bat		
NMSZ	New Madrid Seismic Zone		
NOx	Nitrogen Oxides		
NO <sub>2</sub>	Nitrogen Dioxide		
NPDES	National Pollution Discharge Elimination System		
NRCS	Natural Resources Conservation Service		
NRHP	National Register of Historic Places		
NRI	Nationwide Rivers Inventory		
OSHA	Occupational Safety and Health Administration		
Pb	Lead		
PM	Particulate Matter		
PM <sub>2.5</sub>	Particle Sizes Less Than or Equal to 2.5 Micrometers		
<b>PM</b> <sub>10</sub>	Particle Sizes Less Than or Equal to 10 Micrometers		
SO <sub>2</sub>	Sulfur Dioxide		
SHPO	State Historic Preservation Officer		
SWPPP	Stormwater Pollution Prevention Plan		
TDEC	Tennessee Department of Environment and Conservation		

TNPDES	Tennessee Pollution Discharge Elimination System
TWRA	Tennessee Wildlife Resources Agency
TVA	Tennessee Valley Authority
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WMA	Wildlife Management Area
WQC	Water Quality Criteria
WWC	Wet Weather Conveyance
yd³	Cubic Yard(s)

# **CHAPTER 1 – PURPOSE AND NEED FOR ACTION**

## 1.1 Introduction and Background

Tennessee Valley Authority's (TVA) Gallatin Fossil Plant (GAF) is located approximately 12 miles northeast of Nashville in Sumner County, Tennessee. The plant is on a 1,950-acre reservation along the north bank of the Cumberland River.

GAF was built between 1953 and 1959 and operates four coal-fired, steam-generating units. Four combustion turbine (CT) units were added to GAF in the 1970s, and another four were added in 2000. CTs primarily use natural gas as a fuel and are operated to meet peak power demands at GAF. GAF generates about seven billion kilowatt-hours of electric power in a typical year, which is enough electrical energy to meet the needs of approximately 480,000 homes.

# 1.2 Purpose and Need

TVA proposes to develop a borrow site on TVA-owned property near GAF to support ongoing operations and maintenance activities at GAF. Such current and future actions may include minor erosion repair, site grading, drainage improvements, ash impoundment closure projects, landfill development projects, access road improvements and other general maintenance projects for existing facilities. If and when such actions are undertaken, they will receive separate National Environmental Policy Act (NEPA) review.

# 1.3 Decision to be Made

This Environmental Assessment (EA) has been prepared to inform TVA decision makers and the public about the environmental consequences of developing a borrow site to support current and ongoing construction and maintenance activities at the plant.

TVA will use this EA to support the decision-making process and to determine whether an Environmental Impact Statement should be prepared or whether a Finding of No Significant Impact may be issued.

## 1.4 Related Environmental Reviews and Consultation Requirements

The following environmental reviews have been prepared for actions related to operations at GAF:

- Final EA, Installation of Emission Control Equipment and Associated Facilities at Gallatin Fossil Plant, Sumner County, Tennessee (TVA 2013). This EA evaluated options for air emission controls and other actions, including the construction of a dry CCR landfill at GAF. These projects were needed to support operations at GAF and facilitate compliance with future regulation of CCR produced at GAF.
- Integrated Resource Plan, 2015 Final Report (TVA 2015b). This plan provides direction for how TVA would meet the long-term energy needs of the Tennessee Valley region. This document and the associated Supplemental Environmental Impact Statement evaluate scenarios that could unfold over the next 20 years. It discusses ways that TVA can meet future power demand economically while supporting TVA's mandates for environmental stewardship and economic development across the Tennessee Valley. The report indicated that a diverse portfolio is the best way to deliver low-cost, reliable electricity. TVA released the

accompanying Final Supplemental Environmental Impact Statement for TVA's Integrated Resource Plan in July 2015 (TVA 2015a).

• Gallatin Fossil Plant Bottom Ash Process Dewatering Facility Final EA, Sumner County, Tennessee (TVA 2017b). The EA evaluated the construction of a mechanical bottom ash dewatering facility. Installation of this facility will complete the wet to dry bottom ash conversion at GAF.

# 1.5 Scope of the Environmental Assessment

This EA evaluates the potential environmental impacts associated with the development and operation of a borrow site on TVA-owned land near GAF. Borrow would be used to support ongoing operations and to support future operations at GAF as needed. The location of the proposed borrow site and GAF are shown on Figure 1-1.

The proposed borrow site would be on TVA-owned property near GAF to maximize use of TVA assets and minimize transportation-related impacts and costs associated with obtaining borrow from an offsite, commercial source. This project also includes the construction of an access road within the site from Steam Plant Road (see Figure 1-1). A detailed description of the proposed action and alternatives considered are provided in Chapter 2.

TVA prepared this EA to comply with NEPA, regulations promulgated by the Council on Environmental Quality (CEQ) and TVA's procedures for implementing NEPA. TVA considered the possible environmental effects of the proposed action and determined that potential effects to the environmental resources listed below were relevant to the decision to be made.

- Air Quality
- Vegetation
- Climate Change
- Land Use
- Geology and Soils Threatened and
- Groundwater
- Surface Water
- Prime farmland
- Wildlife
- Aquatic Ecology
- Threatened and Endangered Species
- Wetlands
- Solid and Hazardous
   Waste
- Socioeconomics and Environmental Justice
- Transportation
- Visual Resources
- Cultural and Historic Resources
- Noise
- Health and Safety





TVA assesses the potential impacts on the resources in this EA. TVA also considers potential effects related to floodplains; this resource was determined to be absent within the proposed project area. The proposed borrow site is located outside of the 100-year floodplain. Therefore, the proposed project is consistent with Executive Order (EO) 11988 and would not impact floodplains and their natural and beneficial values.

TVA's action would also satisfy the requirements of EO 11990 (Protection of Wetlands), EO 12898 (Environmental Justice), EO 13112 as amended by 13751 (Invasive Species), and applicable laws including the National Historic Preservation Act (NHPA), Endangered Species Act (ESA), Clean Water Act (CWA), and the Clean Air Act (CAA).

# 1.6 Public and Agency Involvement

TVA's public and agency involvement includes a public notice and a 30-day public review of the Draft EA. The availability of the Draft EA was announced in the Gallatin News and the Sumner County section of the Nashville Tennessean. The Draft EA was posted on TVA's Web site. TVA's agency involvement included notification of the availability of the Draft EA to local, state, and federal agencies and federally recognized tribes as part of the review. Chapter 6 provides a list of agencies, tribes, and organizations notified of the availability of the Draft EA were accepted from July 9 through August 7, 2018 via TVA's Web site, mail, and e-mail.

TVA received one comment letter from a member of the public. The remaining comments received on the Draft EA were from the Tennessee Department of Environment and Conservation (TDEC). All comments were carefully reviewed and the text of the EA was edited as appropriate. Appendix A contains the comments on the Draft EA and TVA's responses to those comments.

# 1.7 Necessary Permits or Licenses

TVA would obtain all necessary permits, licenses, and approvals required for the alternative selected. TVA anticipates the following may be required for implementing the proposed alternatives.

- National Pollution Discharge Elimination System (NPDES) Construction Storm Water Permit for storm water runoff from construction activities. A Storm Water Pollution Prevention Plan would be required to details BMPs as part of this permit requirement.
- Actions involving wetlands and/or stream crossings would be subject to federal CWA Section 404 permit requirements.
- A TDEC Aquatic Resources Alteration Permit (ARAP) would be required for any alterations to streams and wetlands in the areas of effects. A 401 Water Quality Certification would also be required.
- Class V Injection Well Permit from TDEC for modification of karst features may also be required.

Other necessary permits would be evaluated based on site-specific conditions.

# **CHAPTER 2 – ALTERNATIVES**

#### 2.1 Description of Alternatives

TVA considered several options to secure borrow material to support operation and maintenance activities at GAF. These options and TVA's preferred alternative are described below.

#### 2.1.1 Borrow Site Alternatives Considered

TVA completed a Soil Management Study to evaluate potential sources of borrow material needed for projects at GAF. The study was broken into three tasks:

- 1. Determine project needs and evaluate areas on GAF (onsite) for development of borrow sites.
- 2. Evaluate local off-site commercial sources that can provide the needed materials.
- 3. Perform a siting study for off-site properties that could be purchased by TVA and developed as borrow sites.

The results of the study indicated that insufficient quantities of borrow exist at GAF to support all ongoing and future operations. The evaluation of commercial borrow sites within the surrounding region indicated that significant volumes of materials are available. Six offsite properties on non-TVA owned lands were identified that may be viable for potential borrow development; however, these sites were located 11 to 35 miles from GAF.

Subsequently, TVA conducted a study to determine the feasibility of developing an offsite borrow site on a 198-acre site owned by TVA approximately 1.5 miles northwest of GAF. The evaluation of this site confirmed that a significant quantity of suitable soil is available at this location.

TVA considered these results and determined that the development of a borrow site on TVA-owned property at the offsite location approximately 1.5 miles northwest of GAF is preferred. This option would minimize the number of public roadways subject to the transport of borrow, which reduces the long-term impacts associated with air and noise emissions, increased traffic, and associated long-term safety risks, and disruptions to the public that would be associated with transport from a borrow source located further away.

#### 2.1.2 Alternative A – The No Action Alternative

Under the No Action Alternative, TVA would not develop a borrow site on TVA property. As this material is needed to support current and future operations at GAF, TVA would obtain borrow, when needed, from one or more previously permitted commercial sites within 30 miles of GAF.

# 2.1.3 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

TVA proposes to develop a borrow site on TVA-owned property located approximately 1.5 miles northwest of GAF. The borrow site limit of disturbance would encompass approximately 178 acres of the 198-acre project site (Figure 2-1) and is expected to contain suitable soils of sufficient quantity to support ongoing and future borrow requirements at

GAF. Preliminary estimates indicate that approximately 164,000 cubic yards (yd<sup>3</sup>) of topsoil and 987,000 to 1,316,000 yd<sup>3</sup> of clay could be obtained from the borrow site (AECOM 2016).



Figure 2-1. Proposed Borrow Site Project Area and Limits of Disturbance

Development of the borrow site would occur in phases (Phases 1 to 4) (see Appendix B). A Future Reserve Area has also been established to support future operations as needed. Soil excavation would involve the use of heavy equipment including bulldozers, backhoes, excavators, and tri-axle dump trucks. Topsoil in the borrow site would be stockpiled, and borrow soils would be excavated to a maximum depth of approximately 22 feet below ground surface. The majority of the site consists of fallow cropland and deciduous forest. Approximately 37 acres of forested area would be removed; however, the existing tree line along the northern edge of the borrow site would be maintained as a visual and noise buffer. Woody debris and other vegetation may be chipped onsite and used as mulch to prevent erosion or sent offsite to an approved solid waste facility for disposal.

A two-lane gravel road would be constructed on the project site to access the borrow site from Steam Plant Road. The approximately 0.65-mile-long road would be 40 feet wide with 5-foot shoulders and would extend west from Steam Plant Road and cross Cole's Ferry Road. Culverts would be placed in the roadside ditches on the western side of Steam Plant Road and along both sides of Cole's Ferry Road to maintain existing storm water drainage flows. Initial site development activities would only impact lands in the south and western portion of the site, and TVA would install a culvert in the stream at the road crossing. However, TVA estimates that the entire site would eventually be developed to meet the needs for borrow at GAF.

Borrow material would be excavated and loaded onto dump trucks for transport and placement as needed to support current and future projects at GAF. Disturbed areas would be limited to 50 acres or less at any given time. TVA would transport the excavated soil from the borrow site to GAF along existing public roads (see Figure 1-1). Depending on the need of individual projects, TVA estimates an average soil use of up to approximately 500 yd<sup>3</sup> per day. Using an average truck capacity of 15 yd<sup>3</sup>, this would equate to approximately 34 truckloads of borrow or 68 truck trips along Steam Plant Road during borrow site use.

Existing storm water flow patterns would be routed around the borrow site during excavation as needed. Sediment basins would be constructed within the borrow site to prevent sediment deposition into adjacent waterways. Upon cessation of excavation, the borrow site would be graded for proper drainage and vegetated with native, non-invasive plant species. All elements of borrow excavation would be performed in accordance with established TVA policies and other applicable federal, state, and local guidelines for earthwork activities.

Conceptual plans for the borrow site for both the planned development and Future Reserve Area are included in Appendix B.

A summary of the primary characteristics of the proposed borrow site and access road are provided in Table 2-1.

a	nd Access Road in Sumner Count	ty, Tennessee
Project Feature	Relevant Measure	Value
Project area	Project area	198 acres
Borrow site	Limits of disturbance of the borrow site	178 acres
Borrow site	Depth of excavation	Up to 22 feet
Access road	Road characteristics	0.65-mile long 40-foot wide gravel road
Haul route to GAF	Distance between GAF and the borrow site	Approximately 1.5 miles
Method for transport of borrow to the plant	Over the road trucks capable of transporting 34 truckloads per day	68 Truck trips per day
Construction equipment	Including, but not limited to bulldozers, excavators, tri-axle dump trucks (diesel engines), tub grinders, pickup trucks (gasoline engines), skid loaders	

# Table 2-1.Primary Characteristics of the Proposed Borrow Sites<br/>and Access Road in Sumner County, Tennessee

## 2.2 Comparison of Alternatives

The environmental impacts of each of the alternatives under consideration are summarized in Table 2-2. These summaries are derived from the information and analyses provided in the Affected Environment and Environmental Consequences section for each of the resources in Chapter 3.

		Alternative B
Resource	Alternative A No Action	Develop and Operate a Borrow Site on TVA-Owned Property
Air Quality	Minor and periodic, but greater than Alternative B due to increased vehicle miles travelled.	Temporary minor impacts from fugitive dust and emissions from equipment and vehicles during development of the borrow sites and transport of borrow material on public roadways.
Climate Change	Carbon dioxide (CO <sub>2</sub> ) emissions associated with transport of borrow from offsite sources would be minor and would not represent an impact to regional climate change.	Contribution to localized CO <sub>2</sub> emissions from transport of borrow and loss of sequestered carbon related to conversion of forested land would not increase regional greenhouse gas levels and therefore would not contribute to climate change.
Geology and Soils	No impact.	Localized removal of large volumes soil and subsoils for use as borrow. Sinkhole hazards mitigated through appropriate engineering measures and permits. Minor temporary increase in soil erosion, minimized with BMPs. Temporary impact to soil functions until need for borrow ceases and excavated areas are revegetated.
Groundwater	No impact.	Minor impact, groundwater protected by sealing of measures to prevent infiltration to groundwater.
Surface Water	No impact.	Excavation of the borrow site for both planned phases and potential future development would have a direct impact to the 1,694 linear feet of streams and 1,542 feet of WWCs, as well as the 0.7-acre pond within the identified limits of disturbance. However, avoidance and minimization measures would be considered during the detailed design phase to reduce potential impacts to the extent practicable. Unavoidable impacts would be mitigated by purchase of credits from an appropriate stream bank. Watershed level impacts would be minor. Existing stormwater flow patterns would be maintained throughout excavation of borrow, and sediment basins would be constructed within the borrow site limits of disturbance to prevent sediment deposition into adjacent waterways. Appropriate BMPs would minimize impacts

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

Resource	Alternative A No Action	Alternative B Develop and Operate a Borrow Site on TVA-Owned Property associated with soil disturbance and all proposed project activities
Aquatic Ecology	No impact.	Both planned phases and potential future development would result in permanent impact to 1,694 linear feet of streams, as well as the 0.7-acre pond within the identified limits of disturbance. However, avoidance and minimization measures would be considered during the detailed design phase to reduce potential impacts to the extent practicable. Unavoidable impacts would be mitigated by purchase of credits from an appropriate stream bank. aquatic resources are predominantly characterized by headwater streams with low water permanence that support relatively simple and common aquatic ecological communities, and because unavoidable impacts will be mitigated, impacts to aquatic ecology are expected to be minor.
Vegetation	No impact.	Impact due to loss of 37 acres of forest land would be minor given the abundance of forest land in the vicinity.
Wildlife	No impact.	Direct and indirect impacts due to alteration and removal of habitat. However, based on relatively common wildlife communities and abundance of similar habitat in vicinity and fragmented woodland habitat, impacts are considered minor.
Threatened and Endangered Species	No impact.	Impact to potential bat habitat. Impact is minor given the commitment to remove trees between August 1 and March 31 to avoid the non-volant season (time when juvenile bats are unable to fly) and amount of suitable habitat in the vicinity. Based on low habitat quality and absence of recorded or observed occurrences, impacts to other threatened and endangered species are not expected.
Wetlands	No impact.	No impact.
Visual Resources	No impact.	Moderate alteration of local viewshed. No long-term change in scenic class. Impact is minimized through the maintenance of existing tree lines.
Cultural and Historic Resources	No impact.	No adverse effects on historic properties with commitment of avoidance measures for Vinson Cemetery and two archaeological sites.

		Alternative B
Resource	Alternative A No Action	Develop and Operate a Borrow Site on TVA-Owned Property
Land Use	No impact.	Minor impact resulting from the temporary conversion of approximately 178 acres of undeveloped land to industrial use (borrow site and access road). Impact is minor due to abundance of undeveloped land nearby. The site would revert to non-industrial open space and herbaceous vegetation would be reestablished.
Prime Farmland	No impact.	Minor impact relative to the amount of land designated as prime farmland in the region.
Managed and Natural Areas	Minor impact to natural areas along the haul route due to additional truck traffic, noise and dust from the transport of borrow to GAF.	Minor impact to natural areas (Gallatin Steam Plant Wildlife Management Area (WMA), Old Hickory Reservoir, and Old Hickory WMA) along the haul route due to additional truck traffic, noise and dust from the transport of borrow to GAF.
Parks and Recreation	Minor impact to parks as a result of additional truck traffic, noise and dust from the transport of borrow to GAF.	No impact. No parks on the borrow site or along the haul route to GAF.
Transportation	Minor impact related to increased traffic. Greater number of vehicle miles traveled on surrounding roadways compared to Alternative B, with potential increase in crash rates during the transport of borrow from an offsite source.	Minor localized and intermittent effects on traffic flow and safety on Cole's Ferry Road. Minimized with the use of proper safety measures. Minor intermittent impacts on Steam Plant Road.
Noise	Minor, intermittent increase in noise from traffic associated with the hauling of borrow from an offsite source.	Minor, intermittent noise increase to receptors near the borrow site from construction and operation of the borrow site. Forested lands would buffer and reduce noise levels at adjacent receptors.
Socioeconomics and Environmental Justice	No impact.	Potential minor and temporary direct and indirect economic impacts due to increases in employment and spending.
Hazardous and Solid Waste	No impact.	Cleared forested debris removed from the site would be properly managed and disposed of at approved solid waste facilities or recycled in compliance with applicable pertinent federal, state and local requirements.

Resource	Alternative A No Action	Alternative B Develop and Operate a Borrow Site on TVA-Owned Property
Public Health and Safety	Potential safety issues related to obtaining borrow material from offsite sources. Impact would be minor yet greater than Alternative B given the increased transport distance and associated additional man-hours needed	Minor potential safety issues related to transportation of borrow material on existing roadway network, but limited due to short distance to GAF.
Cumulative Effects	No impact.	Minor impacts to air quality, transportation, and noise.

# 2.3 The Preferred Alternative

TVA's preferred alternative is Alternative B under which TVA would develop a borrow site on TVA-owned property located 1.5 miles northwest of GAF. Alternative B meets the purpose and need of the project as it would allow TVA to secure soil material to support current and future operations and maintenance activities at GAF. Such activities may include minor erosion repair, site grading, drainage improvements, ash impoundment closure projects, landfill development projects, access road improvements and other general maintenance projects for existing facilities. Implementation of this alternative would minimize the transport of borrow material from offsite sources to GAF along public roads, which reduces the long-term impacts associated with air emissions, increased traffic and associated long-term safety risks, and disruptions to the public that would be associated with the use of public roadways.

## 2.4 Summary of Mitigation Measures

TVA has identified the following BMPs that would be used to minimize impacts and restore areas disturbed during construction:

- TVA would use applicable BMPs as described in the project-specific storm water pollution prevention plan (SWPPP) and the Tennessee Erosion and Sediment Control Handbook-4<sup>th</sup> Edition, 2012.
- Fugitive dust emissions from site preparation and construction would be controlled by wet suppression and BMPs (CAA Title V operating permit incorporates fugitive dust management conditions).
- Consistent with EO 13751, disturbed areas would be stabilized, which may include seeding with native or non-native, non-invasive plant species to minimize the potential introduction or spread of invasive species.
- TVA would adhere to all appropriate state and county regulatory requirements if burning of landscape waste is conducted.

Mitigation measures designed to avoid, minimize, or compensate for adverse impacts associated with the development of the borrow site, access road and bridge include:

- TVA would comply with the terms and conditions of the TDEC ARAP and U.S. Army Corps of Engineers (USACE) 404 permits, including any compensatory mitigation credits if required, prior to the start of clearing and construction.
- Unavoidable impacts to potential suitable summer roosting habitat for the northern long-eared bat and Indiana bat would be mitigated as required in accordance with ESA. Any tree removal would be scheduled so that all tree clearing would be conducted between August 1 and March 31. Only limited tree removal would occur during the period from August 1 to October 1, and the majority of the tree removal would occur between June 1 and July 31 to avoid any potential direct impact to juvenile bats at a time when they are unable to fly. The majority of tree removal is expected to occur between October 15 and March 31, when bats are not on the landscape.
- The existing tree line along the northern edge of the borrow site would be maintained as a visual and noise buffer to avoid impacts to nearby residences.

TVA has determined that the undertaking would have no effects to any archaeological sites listed or eligible for listing in the National Register of Historic Places (NRHP). The Tennessee State Historic Preservation Officer (SHPO) concurred with this determination by letter dated May 14, 2018 (Appendix D). TVA's determination is predicated on the premise that the following avoidance and minimization measures are implemented:

- Previously identified potentially eligible archeological sites identified within the vicinity of the southernmost borrow site would be flagged with a 100-foot buffer to ensure avoidance during the use of the borrow site.
- If human remains are encountered or accidentally uncovered by earthmoving activities, all activities within the immediate area would cease and the county coroner or medical examiner, a local law enforcement agency, and the state archaeologist's office would be notified at once (Tennessee Code Annotated 11-6-107d). TVA would add contact information for the county coroner or medical examiner, a local law enforcement agency, and the state archaeologist's office to the site risk plan to facilitate adherence to this procedure.

# CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

# 3.1 Air Quality

#### 3.1.1 Affected Environment

#### 3.1.1.1 Regulatory Framework for Air Quality

Through passage of the CAA, Congress mandated the protection and enhancement of our nation's air quality resources and requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment (EPA 2018b). The following criteria pollutants have been set to protect the public health and welfare:

- Sulfur dioxide (SO<sub>2</sub>)
- Ozone
- Nitrogen dioxide (NO<sub>2</sub>)
- Particulate matter (PM) with particle sizes less than or equal to 10 micrometers (PM<sub>10</sub>)
- Particulate matter with particle sizes less than or equal to 2.5 micrometers (PM<sub>2.5</sub>)
- Carbon monoxide (CO)
- Lead (Pb)

The primary NAAQS were promulgated to protect public health, and the secondary NAAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air (EPA 2018c).

In accordance with the CAA Amendments of 1990, all counties are designated with respect to compliance, or degree of noncompliance, with the NAAQS. These designations are either attainment, nonattainment, or unclassifiable. An area with air quality better than the NAAQS is designated as "attainment;" whereas an area with air quality worse than the NAAQS is designated as "non-attainment." Non-attainment areas are further classified as extreme, severe, serious, moderate, or marginal. An area may be designated as unclassifiable when there is a lack of data to form a basis of attainment status. New or expanded emissions sources located in areas designated as nonattainment for a pollutant are subject to more stringent air permitting requirements (EPA 2018b).

Sumner County is in attainment with applicable NAAQS (EPA 2018d) except SO<sub>2</sub>. In June 2010, the EPA revised the primary NAAQS for SO<sub>2</sub> and classified Sumner County as Unclassifiable/attainment with respect to the 1-Hr SO<sub>2</sub> NAAQS (EPA 2018d).

The proposed construction activities would be subject to both federal and state (Tennessee Division of Air Pollution Control) regulations. These regulations impose permitting requirements and specific standards for expected air emissions.

#### 3.1.2 Environmental Consequences

#### 3.1.2.1 Alternative A – No Action Alternative

Under this alternative, the borrow site would not be developed and no onsite project-related impacts to air quality would occur. However, because borrow materials are needed to support GAF's operations, borrow materials would have to be obtained from offsite commercial sources. These commercial sources likely would be a greater distance away from GAF. Assuming a distance of 30 miles for the offsite borrow location, this would result in the transport of up to 2,040 vehicle miles per day under this alternative. Hence, air emissions related to transport of commercial borrow materials would be greater under this alternative than Alternative B due to the increase in vehicle miles travelled.

However, air quality impacts related to transporting borrow materials from offsite commercial sources are expected to be minor and periodic, as borrow materials would only be obtained as needed to support operation and maintenance activities requiring fill such as minor erosion repair, site grading, and other activities such as drainage improvements.

#### 3.1.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

#### 3.1.2.3 Construction and Operation Impacts

Development and operation of the proposed borrow site and access road require the use of earthmoving and compacting equipment as well as trucks for hauling materials. Construction-related air quality impacts would be related primarily to operation of internal combustion engines and generation of fugitive dust during site preparation activities and the transport of borrow.

Combustion of gasoline and diesel fuels by internal combustion engines (vehicles, generators, construction equipment, etc.) would generate local emissions of CO, nitrogen oxides (NO<sub>x</sub>), PM, SO<sub>2</sub>, and volatile organic compounds during their use. However, new emission control technologies and fuel mixtures have significantly reduced vehicle and equipment emissions. Additionally, it is expected that all vehicles and construction equipment would be properly maintained, which also would reduce emissions. The types of construction equipment expected to be required for the proposed construction and operation of the borrow site are provided in Table 2-1.

Emissions from internal combustion engines during construction and operation would result in minor short-term local effects on air quality due to the relatively low number of vehicles employed, adherence to equipment maintenance requirements, and continued improvement of emission control measures and fuel blends.

Up to 34 truckloads (68 truck trips) of borrow would be transported to GAF per day on graveled (borrow site access road) and on paved road (Steam Plant Road). Assuming a distance of 1.5 miles for the near offsite borrow location, this would result in the transport of up to 102 vehicle miles per day under this alternative. Equipment movement on unpaved portions of the access road would produce fugitive dust that could affect particulate levels. Fugitive dust produced from borrow site activities would be temporary and controlled by BMPs (e.g., wet suppression) as stated in the TVA's fugitive dust control plans as required under existing CAA Title V operating permits.

Air quality impacts from construction activities would be temporary, and transportation of borrow material to support GAF construction activities would only occur when borrow material is needed. Additionally, emissions related to truck transport of borrow from the

near offsite location to GAF would be markedly lower than that of the No Action Alternative based on the vehicle miles traveled. Air quality impacts are dependent upon both manmade factors (e.g., intensity of activity, control measures, vehicle maintenance) and natural factors (e.g., wind speed, wind direction, soil moisture). However, even under unusually adverse conditions, emissions from construction and operation of the borrow site would have, at most, a minor transient impact on onsite and offsite air quality and would be well below the applicable ambient air quality standard.

# 3.2 Climate Change and Greenhouse Gases

# 3.2.1 Affected Environment

"Climate change" refers to any substantive change in measures of climate, such as temperature, precipitation, or wind lasting for an extended period (decades or longer) (EPA 2016). The 2014 National Climate Assessment concluded that global climate is projected to continue to change over this century and beyond. The amount of warming projected beyond the next few decades, by these studies, is directly linked to the cumulative global emissions of greenhouse gases (GHGs) (e.g., CO<sub>2</sub>, methane). By the end of this century, the 2014 National Climate Assessment concluded a 3°F to 5°F rise can be projected under the lower emissions scenario and a 5°F to 10°F rise for a higher emissions scenario (Melillo et al. 2014).

Climate change is primarily a function of too much  $CO_2$  in the atmosphere.  $CO_2$  is the primary GHG emitted through human activities. Activities associated with the proposed action that produce  $CO_2$  are primarily related to emissions from fossil-fuel-powered equipment (e.g., bulldozers, loaders, haulers, trucks, generators) used during the proposed activities.

Forested areas that absorb and store  $CO_2$  from the atmosphere via a process known as carbon sequestration help to reduce levels of  $CO_2$  in the atmosphere. Approximately 37 acres of forested land is present within the proposed borrow site.

## 3.2.2 Environmental Consequences

## 3.2.2.1 Alternative A – No Action Alternative

Under this alternative, the borrow site would not be developed, and no project-related impacts to regional GHG levels or climate change would occur. However, because borrow materials are needed to support GAF's operations, borrow materials would have to be obtained from offsite commercial sources. These commercial sources likely would be a greater distance away from GAF. Assuming a distance of 30 miles for the offsite borrow location, this would result in the transport of up to 2,040 vehicle miles per day under this alternative. Hence, GHG emissions related to transport of commercial borrow materials would be greater under this alternative than Alternative B due to the increase in vehicle miles travelled. Overall,  $CO_2$  emissions associated with this alternative would be minor and are not anticipated to result in increases in regional GHG levels or impact climate change.

## 3.2.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

As discussed in Section 3.1,  $CO_2$  emissions would occur from exhaust emissions of fossilfueled vehicles and construction equipment during construction activities. Due to the small number of vehicles and construction equipment involved, only a minor temporary increase in  $CO_2$  emissions would be anticipated as a result of the construction of the access road and borrow site development. Such emission levels are *de-minimis* in comparison to the regional and world-wide volumes of CO<sub>2</sub>. Therefore, local and regional GHG levels would not be adversely impacted by emissions from construction activities.

In the long-term, borrow needed to support construction activities at GAF would be transported using dump trucks which would result in emissions of GHG. Assuming a distance of 1.5 miles for the near offsite borrow location, this would result in the transport of up to 102 vehicle miles per day under this alternative. Due to short distance and intermittent nature of borrow transport, the trucks would produce a minor, long-term increase in  $CO_2$  emissions, but are not anticipated to increase regional GHG levels or impact climate change.

The EPA has developed equations to estimate the amount of carbon sequestration that may be lost from the conversion of forested land. Assuming that approximately 37 acres of forested areas (the land cover with the greatest potential carbon sink) are completely cleared for development of the borrow site, and the forest composition and age are typical for the region (i.e., Tennessee); the conversion of these forested areas would result in the loss of sequestered carbon equivalent to approximately 31.7 metric tons per year (EPA 2018a). In comparison, within a 5-mile radius of GAF, the existing local forested lands sequester approximately 14,070 metric tons of carbon per year. The loss of carbon storage related to the development of the borrow site is very small relative to the carbon sequestration in the region has increased due to net increases in forest areas (e.g., conversion of farmland to forested areas), improved forest management, as well as higher vegetation growth productivity rates and longer growing seasons. Because of the small forested area involved relative to the forest cover in the vicinity, the development of the borrow site is not anticipated to result in increases in regional GHG levels or impact climate change.

# 3.3 Geology and Soils

# 3.3.1 Affected Environment

GAF is located in the outer (north central) portion of the Central Basin section of the Interior Lowlands physiographic province, which is a large topographic lowland resulting from the erosion of a geologic structure known as the Nashville Dome. Bedrock of the Nashville Dome generally consists of Ordovician limestones, dolomites and shales. Average elevations within the basin range between 450 to 650 feet above mean sea level (msl). The Central Basin is encircled by land of notably higher elevation known as the Highland Rim, which ranges from 700 to 1,200 feet msl.

The proposed borrow project site encompasses approximately 198 acres. Topographically, the ground surface slopes downward from a high elevation of approximately 600 feet msl in the southwestern portion of the site to the north, south and east. Elevation along the eastern end of the property is approximately 540 feet msl. The published geologic map, Tennessee Division of Geology - Laguardo Geologic Quadrangle – 1964 (Miller and Wilson 1964) shows that the proposed borrow site overlies Ordovician Age rock composed of the Nashville Group Cathys Formation at highest elevation, followed by the Bigby-Cannon Limestone, Hermitage Formation, Carters Formation and Lebanon Formation (Figure 3-1). The Cathys Formation is a shaly medium to dark brown-gray, thin bedded limestone. The Bigby-Cannon Limestone consists of limestones with slightly different physical characteristics. The Hermitage Formation is composed of medium to dark gray, limestone thinly bedded shale layers. The Carters Formation is a medium to dark gray limestone with thin shale layers. The Lebanon Formation is a medium to dark gray limestone with thin

bedded shale layers. All of these limestone formations are essentially flat-lying. The bedrock strata have been subjected to an extended period of erosion which has produced a series of moderate to steeply sloping hills and broad valleys. The Cumberland River has subsequently deposited a blanket of alluvium at lower elevations over the bedrock. Depth to bedrock varies from approximately 2 to 22 feet below the existing ground surface and averaged 11 feet below the existing ground surface.



Figure 3-1. Geology of the Proposed Borrow Site

#### 3.3.1.1 Geologic Hazards

#### 3.3.1.1.1 Karst Topography

"Karst" refers to a type of topography that is formed when rocks with a high carbonate content, such as limestone and dolomite, are dissolved by groundwater to form sink holes, caves, springs and underground drainage systems. Karst topography forms in areas where limestone and dolomite are near the surface.

The proposed borrow site is underlain by limestone rocks and karst features including sinkholes, and given the geologic setting new karst features may develop at any time. Several sinkholes were identified on the borrow site (see Figure 3-2 water resources).

#### 3.3.1.1.2 Fractures

Both horizontal and high-angle fractures were observed in rock core collected from GAF. Most fractures observed in the rock core are nearly horizontal, parallel to bedding. These fractures are generally developed along bedding planes, shaly layers, or other natural weaknesses in the rock. Within the Bigby-Cannon, Hermitage, Carters, and Lebanon formations, these fractures are generally tight, although they may show slight to moderate weathering at shallow depths (Wood 2017).

#### 3.3.1.1.3 Seismic Events

The primary earthquake hazard source to the site is the New Madrid Seismic Zone (NMSZ). The NMSZ is located in the central Mississippi Valley and extends from northeastern Arkansas to northwestern Tennessee and southeastern Missouri. The NMSZ is approximately 200 miles west of the Gallatin facility. Although the majority of the events emanating from this zone are too small to be felt at the surface, the NMSZ has produced several damaging earthquakes, including the sequence of very large earthquakes and aftershocks in 1811-1812. The "Geologic Hazards Map of Tennessee – Environmental Geology Series No. 5" developed and published by the TDEC, Division of Geology and compiled by Robert Miller (1978) classifies the area as Risk Zone 1, low to moderate damage possible.

#### 3.3.1.1.4 Faults and Liquefaction Potential

There are two general categories of earthquake hazards: primary and secondary. Primary hazards include fault ground rupture and strong ground shaking. If an earthquake is larger than about magnitude 5.5, ground rupture may occur on the fault. The amount of displacement generally increases with the magnitude of the earthquake. No faults have been mapped at or near the proposed borrow site area that are believed to be sources of higher magnitude earthquakes during the most recent geologic period (Quaternary).

Secondary hazards include liquefaction/lateral spreading, land sliding, and ground settlement. Liquefaction is essentially loss of strength in generally granular, saturated materials, including alluvial and fluvial deposits subjected to ground shaking. Liquefaction can result in ground settlement, and where there is a free face, such as river bank, can result in ground spreading toward the free face. Liquefaction can also damage foundation, pavement, and pipelines and underground utilities. Impacts from these secondary hazards are expected to be low in the case of the development and operation of a borrow site and gravel access haul road.

#### 3.3.1.2 Soils

According to the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) web soil survey (NRCS 2018), most of the mapped soils in the proposed Borrow

Site are silt loams. The extent, clay content, and Unified Soil Classification of the soils mapped within the proposed Borrow Site are shown in Table 3-1.

Soil Map Unit (Symbol) Name	Acres
Barfield-Rock outcrop complex, 5 to 20% slopes (BaC)	27.7
Harpeth silt loam, 2 to 5% slopes, eroded (HhB2)	92.8
Harpeth silt loam, 5 to 10% slopes, eroded (HhC2)	33.9
Mimosa silt loam, 5 to 12% slopes, eroded (MmC2)	7.3
Mimosa silt loam, 5 to 20% slopes, eroded, very rocky (MnC2)	15.4
Water	1.0
Total	178

 Table 3-1.
 Potentially Impacted Soils of the Proposed Borrow Site

Source: NRCS 2018

Within the borrow site, soil boring data collected by TVA indicates that the borrow site is overlain by topsoil which varied in thickness from 12 to 14 inches, having an average thickness about 12 inches. Clays with medium to high plasticity were encountered below the topsoil to depths of 2 to 6 feet below the ground surface. These clays were underlain by high plasticity clays which extended to bedrock (AECOM 2016).

# 3.3.2 Environmental Consequences

#### 3.3.2.1 Alternative A – No Action Alternative

Under Alternative A, no excavations or construction of an onsite borrow site would occur. Therefore, there would be no impacts to geological or soil resources.

## 3.3.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

Development of the borrow site would involve ground disturbing activities that would include clearing and grubbing. Topsoil in the borrow site would be stockpiled, and borrow soils would be excavated to a depth of up to 22 feet below ground surface. As described above, the bedrock underlying the proposed borrow site is composed of carbonate rocks. Neither access road construction nor excavation of the borrow site are expected to impact bedrock formations.

Sinkholes are present on the proposed borrow site. TVA will develop a work plan for the identification and mitigation of these features. The plan will identify procedures to be followed when a sinkhole is identified, including avoiding the area until the extent of the feature can be adequately characterized. Appropriate engineering measures designed to mitigate impacts associated with sinkholes would be implemented. In addition, the State of Tennessee requires that any sinkhole to be affected by construction activities are repaired under the jurisdiction of a Class V Injection Well Permit. The permit allows the sinkhole to be formally repaired using a reverse graded filter or modified by creating an injection point that would allow surface water to enter the subsurface directly. Construction storm water would be diverted away from sinkholes.

Geological related operational impacts are associated with the potential effect of earthquakes on the proposed borrow site. Because no faults have been mapped at or near

the site that are believed to be sources of higher magnitude earthquakes, the potential for surface fault rupture as well as secondary hazards related to liquefaction is considered to be low. Accordingly, seismic impacts at the proposed borrow site are expected to be negligible.

Approximately 178 acres of surface soils would be impacted under this alternative. Clearing and grubbing have the potential to disturb soil stability and increase erosion. Despite this, impacts to soil resources related to the proposed clearing and grubbing activities are expected to be minor. BMPs outlined in the SWPPP would be implemented to minimize erosion during land clearing, site preparation, and access road construction. Development of the borrow site includes the construction sediment basins which would limit the amount of soil transported from borrow site to surface water drainage ways via storm water by detaining the runoff and trapping sediment.

Large volumes of surface soil and subsoil would be removed from the borrow site to support the future construction projects at GAF. When the need for borrow ceases, the excavated areas would be graded for proper drainage and reseeded with grass to help promote soil stability, native soil biota, and re-establishment of soil functions. Soil functions in these areas would be adversely impacted until restoration is completed.

# 3.4 Groundwater/Geohydrology

#### 3.4.1 Regulatory Framework for Groundwater

The regulatory framework established to protect groundwater is defined in the Safe Drinking Water Act of 1974, Wellhead Protection Program, and CCR Rule. The Safe Drinking Water Act of 1974 established the sole source aquifer protection program which regulates certain activities in areas where the aquifer (water-bearing geologic formations) provides at least half of the drinking water consumed in the overlying area.

## 3.4.2 Affected Environment

#### 3.4.2.1 Regional Aquifers

Many wells have been installed at the GAF peninsula to assess and monitor groundwater conditions across the site (URS 2013). Groundwater-bearing fractures were identified in the Hermitage, Carters, and Lebanon formations. Identified water-bearing fractures are typically horizontal, parallel to bedding. Although fractures can occur almost anywhere in the Hermitage and Upper Carters formations, these water-bearing fractures are perched and have not been found to be laterally continuous across the site. Many wells and borings in these formations are dry. Groundwater in water-bearing fractures is typically found in the Lower Carters Limestone only where this formation is present at the ground surface (that is, the overlying formations have been eroded), which is not the case at the borrow site. Water-bearing fractures are more consistently found in the deeper Lebanon Limestone. Groundwater flow is generally towards the Cumberland River.

The groundwater in the carbonate formations is typically of the calcium or calciummagnesium bicarbonate water type. Groundwater chemistry is controlled primary by dissolution of limestones and dolomites.

Recent drilling at the borrow site identified the first water-bearing fracture zone at a depth of over 200 ft within the Lebanon Limestone.

In 2016, a groundwater use survey was performed to identify usable water wells within and surrounding the proposed borrow site area (Haley & Aldrich 2017). Survey activities included a visit to each property within the study area and if a well was present, request access to collect groundwater samples at a later date. A total of 29 wells were identified within the survey area of which nine were sampled, analyzed, and compared to human health screening levels. No groundwater wells were identified within the proposed borrow site during the survey. Of the wells identified during the survey, two were described as used for drinking water and are located on Odoms Bend Road, south and downgradient of the proposed borrow area. None of the constituents detected in well samples were reported at concentrations above federal or state primary drinking water standards.

## 3.4.3 Environmental Consequences

#### 3.4.3.1 Alternative A – No Action Alternative

Under Alternative A, no construction of an onsite borrow site would occur. Consequently, no impacts to groundwater resources would occur under this alternative.

#### 3.4.3.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

TVA conducted a study to evaluate the subsurface conditions at the proposed borrow site. Nineteen soil borings were advanced to the bedrock surface. Groundwater was not encountered in any of the borings. Proposed excavation areas are expected to terminate at or near bedrock and are not expected to encounter groundwater.

During operation of the borrow site, BMPs, as described in *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA 2017a), would be implemented to avoid contamination of shallow groundwater, if present in the project area, and control sediment infiltration from storm water runoff during borrow site development. For both sinkholes and other karst features identified during excavation, the feature would be sealed to prevent surface water infiltration to groundwater.

Because water producing aquifers are deeper and substantially unaffected by proposed construction activities and protected by sealing measures to prevent surface water infiltration to groundwater, impacts to regional groundwater availability and water quality are expected to be minor.

## 3.5 Surface Water Resources

#### 3.5.1 Affected Environment

GAF is located on the north bank of the Cumberland River between Cumberland River mile (CRM) 240 and 246. This portion of the Cumberland River is impounded by Old Hickory Dam (owned and operated by the USACE) at approximately CRM 216.2. Stream flow varies with rainfall and averages about 21 inches of runoff per year. This equates to approximately 1.5 cubic feet per second (cfs) per square mile of drainage area. Pool elevations (feet above sea level) for CRM 242.5 are:

- Normal Minimum: 442.00
- Normal High: 445.00
- 10 Year Storm: 451.50
- 25 Year Storm: 451.80
- 50 Year Storm: 452.20

• 100 Year Storm: 452.60

Old Hickory Reservoir is a mainstream storage impoundment on the Cumberland River. The reservoir contains 22,500 surface acres at an elevation of 445 feet (above sea level) and extends 97.3 river miles. Water level fluctuations are minimal with minimum pool elevation at 442 feet (USACE 2012).

The surface area and volume of the reservoir at normal minimum and high pool elevations are 19,550 and 22,500 acres, respectively; and 357,000 and 420,000 acre-feet, respectively.

For the period 1957 through 2005, the annual mean flow at Old Hickory Dam was 19,110 cfs, the lowest daily mean was 200 cfs (November 3, 1957); the annual 7-day minimum was 1,070 cfs (October 28, 1969), and 90 percent of the time flow exceeded 5,390 cfs. During 2005, the mean flow was 20,440 cfs, and the lowest daily mean flow was 4,270 cfs (USGS 2005).

The USACE maintains water quality monitoring locations above and below GAF at CRM 245.0 and CRM 241.0, respectively. Parameters monitored are mostly related to eutrophic conditions (dissolved oxygen, temperature, pH, and nutrients), but some data is available for a comprehensive list of parameters, including major and minor ions and trace metals. The Cumberland River and its tributaries generally exhibit moderate to high concentrations of calcium and magnesium and a slightly alkaline pH because much of the basin is comprised of limestone and dolomitic bedrock. Total dissolved solids concentrations, a measure of all salts in solution, range from 94 to 173 milligrams per liter (mg/L) in the data retrieved from the USACE monitoring stations between June 2012 and September 2015. The metals concentrations at both station locations above and below the GAF facility were evaluated and were found to display concentrations below the TDEC water quality criteria (WQC), except for thallium, cadmium and one lead reading (upstream of the facility). The thallium and cadmium exception (found at both upstream and downstream locations) are an artifact produced by the method of treating censored data (i.e., values below detection limits set equal to one-half detection limit), and the fact that the thallium and cadmium detection laboratory limits of 0.0005 milligrams per liter (mg/L) exceed the TDEC criterion. These results, however, are due to limitations in testing methods and do not represent true impacts to water quality due to thallium and cadmium concentrations. The one lead concentration that was higher than the WQC was upstream in 2012 and was not assumed to be site related (USACE 2012-2015).

The Cumberland River from CRM 216.2 to 309.2 (Caney Fork River) is classified by TDEC (TDEC 2013) for the following uses:

- Domestic Water Supply
- Industrial Water Supply
- Fish and Aquatic Life
- Recreation
- Livestock Watering and Wildlife
- Irrigation Livestock Watering and Wildlife
- Navigation

• Trout Stream

Specific standards are established for each of these uses with the most stringent associated with domestic water supply and fish and aquatic life. TDEC assesses the status of the streams, rivers, and lakes annually. The project area drains to the west to an Unnamed Tributary to Bulls Creek and to the Cumberland River (at Old Hickory Reservoir) and to the east to Newton Lake Creek and drains within the 8-digit Hydrologic Unit Code (HUC) Lower Cumberland-Old Hickory Lake Watershed. No streams in the vicinity of the proposed borrow site project area are listed on the TDEC 303(d) list for impaired waters. (TDEC 2016a). Additionally, portions of Bledsoe Creek in Bledsoe Creek State Park, Old Hickory WMA, and Cragfont State Historic Area, are designated by the state as exceptional Tennessee Waters. Given their distance from the proposed borrow site (between 3 and 5 miles to the east), these streams are not expected to be impacted by this proposed action.

#### 3.5.1.1 Project Area Surface Water Features

Jurisdictional streams and wetlands were delineated within the proposed borrow site project area in January 2018 (Wood). Wetlands are addressed in Section 3.10. The field survey identified 2,311 linear feet (LF) of perennial streams, one spring, a 0.7-acre pond, and seven wet weather conveyances (WWCs)/ephemeral streams with a total length of 2,655 LF (Figure 3-2) within the borrow site project area. STR-01 is impounded near its upper most reach creating the pond. Based on the presence of fish and other observed aquatic fauna, the pond appears to be perennially inundated.

The spring (SPG-01) is located near the east property boundary and originates at a spring box and flows approximately 74 LF, where it meets STR-01. In addition to the above mentioned aquatic features, seven sinkholes were noted.



Figure 3-2. Surface Water Features of the Proposed Borrow Site Project Area

## 3.5.2 Environmental Consequences

#### 3.5.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, the onsite borrow site would not be developed. There would be no change to the environmental conditions of this site and therefore no impact to surface water resources.

#### 3.5.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

Development of the borrow site would involve ground disturbance and construction activities resulting in the potential for increased sediment release and erosion to downstream areas. On-going operations would potentially generate dust and sediment loading as a result of storm water runoff and equipment washing. Land disturbance would be long term, occurring throughout the duration of borrow site operation. The development of the borrow site, currently planned for disturbance in phases, would be expected to have a direct and/or indirect impact to all or a portion of 208 linear feet of streams and 1,281 LF of WWCs during Phases 1-4. The spring observed to be located along the eastern boundary of the borrow site would be avoided. During Phases 1-4, only a small portion of the stream and a significant portion of the WWCs would be directly impacted with the need to add a haul road, culvert and sediment basins to provide treatment for storm water discharges.
In addition to Phases 1-4, TVA has also identified a portion of the site as a Future Reserve Area, which would be used as needed to support future operations. If borrow needs progress into the use of the Future Reserve Area, the majority of the streams would be directly impacted by encapsulation of the streams or the use of rip rap as part of the stream bed. Avoidance and minimization measures would however, be considered during the detailed design phase to reduce potential impacts to the extent practicable. The use of borrow in the Future Reserve Area would be expected to have a direct or indirect impact to an additional 1,486 LF of stream(s), 261 LF of WWC(s) and potentially a portion of the 0.7 acre pond.

The borrow site is depressed relative to the surrounding landscape, and existing storm water flow patterns would be maintained during initial site development. Sediment basins would be constructed within the borrow site limits of disturbance to prevent sediment deposition into adjacent waterways. Upon completion of excavation, the borrow site would be graded for proper drainage and vegetated with native, non-invasive plant species. Soil erosion and turbidity, as well as other potential water quality concerns, may be reduced due to lower runoff rates. The affected area is relatively small compared to the Cumberland-Old Hickory Lake Watershed area.

TVA would comply with all appropriate state and federal permit requirements. A General Permit for Storm Water Discharges Associated with Construction Activities (TDEC 2016b) would be required for this project, and this permit would require development of a project-specific SWPPP. TVA would use applicable BMPs as described in the project-specific SWPPP and the *Tennessee Erosion and Sediment Control Handbook-4th Edition, 2012*. Stream alteration would require a TDEC ARAP, 401 Water Quality Certification and USACE 404 permit and the terms and conditions of these permits would likely require mitigation from proposed activities that would cause impacts to these resources. Mitigation measures would be implemented to mitigate these impacts through the regulatory process described above. Additionally, seven sinkholes are located on the site. Sinkholes impacted by borrow site development could require Class V Injection Well permits and possible mitigation for some activities (e.g. for grouting).

Appropriate BMPs would be followed to minimize impacts associated with soil disturbance and all proposed project activities (including equipment washing and dust control discharges). Additionally, all construction and operation activities would be conducted in a manner to ensure that waste materials are contained and managed appropriately (e.g., refueling, maintenance activities, and storage of equipment) to ensure that the introduction of pollutants to the receiving waters would be minimized or avoided.

Proposed project activities that result in direct impacts to surface water resources would be mitigated as appropriate in conjunction with agency consultation. Additionally, BMPs would be used that would further reduce indirect impacts to surface water. Therefore, both direct and indirect impacts to surface water resources are anticipated to be minor.

# 3.6 Aquatic Ecology

## 3.6.1 Affected Environment

The proposed borrow site is located in Sumner County, Tennessee, in the Outer Nashville Basin subregion of the greater Interior Plateau ecoregion and is characterized by an area of rolling topography and higher elevations than the Inner Nashville Basin (Griffith et al. 2009). A January 2018 field survey of the project area documented three streams, seven WWCs, one spring, and one pond within the limits of the project area.

TVA evaluated the condition of riparian corridors and instream habitat at each stream within the proposed borrow site during a January 2018 field survey (Table 3-2). Hydrologic determinations were made using the Tennessee Division of Water Pollution Control (Version 1.4) field forms by Tennessee qualified hydrologic professionals. This analysis evaluated the geomorphology, hydrology, and biology of each stream within the project area.

Three classes were used to indicate the current condition of streamside vegetation across the length of the proposed project area, as defined below, and accounted for in Table 3-2.

- Forested Riparian area is fully vegetated with trees, shrubs, and herbaceous plants. Vegetative disruption from mowing or grazing is minimal or not evident. Riparian width extends more than 60 feet on either side of the stream.
- Partially forested Although not forested, sparse trees and/or scrub-shrub vegetation is present within a wider band of riparian vegetation (20 to 60 feet). Disturbance of the riparian zone is apparent.
- Non-forested No or few trees are present within the riparian zone. Significant clearing has occurred, usually associated with pasture or cropland.

Forested riparian zones and buffers are associated with both the perennial and WWCs on the project site and contribute to improved streambank stability and increased shading of the aquatic environment. Streams of the Outer Nashville Basin ecoregion are typically low to moderate gradient, with productive, nutrient-rich waters resulting in algae, rooted vegetation, and occasionally high densities of fish.

No fish were observed in streams identified within the borrow site project area. Numerous crayfish and aquatic macroinvertebrates were observed during the field visit. Watercourses that convey only surface water during storm events (such as ephemeral streams/WWCs) do not support aquatic biota but can transfer surface water runoff to adjacent streams. Based on field review the pond appears to be perennially inundated and was observed to support fish and other observed aquatic fauna that are common to such environments.

					•	
Aquatic Streams		Total Length	Planned Development [Phases 1 to	Future Reserve		Riparian
	Permanence	(feet)	4 (feet)]	Area (feet)	Field Notes	Condition
Stream - 01	Perennial	1,714	208	889	Riffle/ pool complex with cobble/ bedrock substrate. Crayfish and aquatic macroinvertebrates observed.	Forested
Stream - 02	Perennial	535	0	535	Aquatic snails, isopods, and crayfish observed.	Forested
Stream - 03	Perennial	62	0	62	Feeds Stream 1. flows out of the ground	Forested
Subtotal		2,311	208	1,486		
WWC-01	WWC	55	0	55	Wash at the head of Stream-02	Forested
WWC-02	WWC/Ephemeral	677	0	0	Swale in field then down cuts at head cut in semi-forested section of field. Meets USACE definition of ephemeral at head cut.	Partially forested
WWC-03	WWC	217	161		Ditch in field, flows to a sinkhole	Non-forested
WWC-04	WWC/Ephemeral	721	604	82	Weak bed and bank Dry at time of survey. Channel breaks down.	Forested
WWC-05	WWC/Ephemeral	338	No impact	No impact	Swale with vegetation obscuring channel. Dry at time of survey	Non- forested.
WWC-06	WWC	516	516	0	Channel runs into depression with sinkholes. Dry at time of survey	Non-forested
WWC-07	WWC	131	0	124	Small channel that terminates at sinkhole. Dry at time of survey	Forested
Subtotal		2,655	1,281	261	·	
Pond 01	Pond	0.7 acres		0.7 acres	Impounded portion of Stream 01	Forested
Spring 01	Perennial Spring	74	0	0	Originates at a spring box and flows into Stream 01	Non- forested.

# Table 3-2.Summary of Stream Habitat Observations from January 2018 Field Survey of<br/>the GAF Project Site

## 3.6.2 Environmental Consequences

#### 3.6.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, TVA would not use the site for soil borrow. Consequently, no impacts to aquatic ecology would occur as a result of TVA actions.

#### 3.6.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

Under this alternative TVA would excavate all lands within the limits of disturbance identified in Figure 3-2. Aquatic ecosystems and associated aquatic biota within the perennial stream and intermittent streams within the project area would be impacted in conjunction with the progressive development of the borrow site in four planned development phases (Phases 1 to 4) and result in the eventual conversion of up to 208 feet of streams and up to 1.281 feet of WWCs (see Table 3-2). Initial site development activities would only impact lands in the south and western portion of the site and would only require installation of a culvert across the perennial stream. However, TVA has also identified a portion of the site as a Future Reserve Area which would be used as needed to support future operations. If borrow needs progress into the use of the Future Reserve Area, the majority of the streams would be directly impacted by encapsulation of the streams or the use of rip rap as part of the stream bed. Avoidance and minimization measures would however, be considered during the detailed design phase to reduce potential impacts to the extent practicable. The use of borrow in the Future Reserve Area would be expected to have a direct or indirect impact to an additional 1,486 LF of stream(s), 261 LF of WWC(s) and potentially a portion of the 0.7 acre pond. Impacts to aquatic ecosystems would include the direct mortality of less mobile biota, the local loss of aquatic habitat, and potential alteration of hydrology in the perennial stream downstream of the borrow site. Other potential effects resulting from soil borrow activities include alteration of stream banks and stream bottoms by heavy equipment and by sediment runoff into streams downgradient of the borrow site. Siltation has a detrimental effect on many aquatic animals adapted to riverine environments. Turbidity caused by suspended sediment can negatively impact spawning and feeding success of fish and mussel species (Brim Box and Mossa 1999; Sutherland et al. 2002).

Applicable ARAP and USACE 404 Permits would be obtained for any stream alterations located within the project area and the terms and conditions of these permits would require mitigation from the proposed activities. Streamside management zones and BMPs identified in the TDEC Erosion & Sediment Control manual (TDEC 2012b) would be implemented to minimize the potential for impacts to water quality and instream habitat for aquatic organisms. These measures would be implemented until the use of lands containing the perennial and intermittent streams is necessary by the progressive development of the borrow site. These guidelines outline site preparation standards with emphasis on soil stabilization practices, structural and sediment controls including runoff management, and general stream protection practices associated with construction activities. Furthermore, TVA would follow BMPs identified within *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA 2017a).

TVA considered the potential to avoid effects to aquatic resources by limiting site development. However, based on TVA's expected needs for borrow material in conjunction with plant operations, TVA determined that full development of the borrow site would be

required. Therefore, under the final borrow site development plan, unavoidable adverse impacts would occur to the streams and the pond. The streams documented within the proposed project footprint would require mitigation from the project activities and TVA would work with both TDEC and USACE to purchase stream mitigation credits as necessary. Therefore, because the aquatic resources are predominantly characterized by headwater streams with low water permanence that support relatively simple and common aquatic ecological communities, and because unavoidable impacts will be mitigated, impacts to aquatic ecology are expected to be minor.

# 3.7 Vegetation

## 3.7.1 Affected Environment

The proposed borrow site would be located in the Outer Nashville Basin Level IV ecoregion (Griffith et al. 1998). The Outer Nashville Basin is comprised of open, gently rolling to steep hills, with highly dissected escarpments. Oak-hickory forests are prevalent, with this forest type being transitional between the dryer oak-hickory forest to the west and the more mesic/ mixed mesophytic forest to the east. Land use and cover is a mixture of cropland, mixed forest, pasture, and urban, generally with deciduous forest on ridge caps, pasture on hillsides, and crops on the foot slopes. Land cover is summarized in Table 3-3 and illustrated in Figures 3-3 and 3-4.

Table 5-5.	Land Cover of Project Area and vicinity					
Land Cover Type	Proposed Borrow Site Limit of Disturbance		Total Project Site		Vicinity (5-mile radius)	
	Acres	Percent	Acres	Percent	Acres	Percent
Barren Land					153	0.3%
Cultivated Crops <sup>1</sup>	128.1	72.0%	134.5	68.0%	2,950	4.9%
Deciduous Forest	37.3	21.0%	47.2	23.9%	13,606	22.8%
Developed, High Intensity					548	0.9%
Developed, Low Intensity	0.6	0.3%	1.0	0.5%	2,925	4.9%
Developed, Medium						2.5%
Intensity					1,497	
Developed, Open Space					7,897	13.2%
Emergent Herbaceous						0.4%
Wetlands					244	
Evergreen Forest					1,775	3.0%
Hay/Pasture					18,273	30.6%
Herbaceous	11.3	6.3%	14.3	7.2%	1,123	1.9%
Mixed Forest					924	1.6%
Open Water	0.7	0.4%	0.7	0.3%	6,975	11.7%
Shrub/Scrub					486	0.8%
Woody Wetlands					249	0.4%
Total	178.0	100.0%	197.7	100.0%	59,624	100%

Land Cover of Project Area<sup>2</sup> and Vicinity<sup>3</sup> Table 2-2

<sup>1</sup>Note: this land cover type within the project area consists of fallow fields



Figure 3-3. Land Cover Within the Proposed Borrow Site Limits of Disturbance



Figure 3-4. Land Cover Within 5 Miles of the Proposed Borrow Site

Final Environmental Assessment

Field surveys of the proposed borrow site were conducted in January 2018 to document plant communities, infestations of invasive plants, and to search for possible threatened and endangered plant species in the project area. All areas along the proposed project were searched during these field surveys. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys can be classified as a combination of deciduous forest, evergreen, mixed evergreen deciduous forest, and herbaceous vegetation. Vegetation throughout areas where the proposed borrow site would be located is characterized by two main types: herbaceous (78 percent) and deciduous forest (21 percent) (see Table 3-3). The plant communities observed on-site are common and well represented throughout the region. No forested areas in the proposed project area had structural characteristics indicative of old growth forest (Leverett 1996).

Herbaceous vegetation is characterized by greater than 75 percent cover of forbs and grasses and less than 25 percent cover of other types of vegetation. Fields (fallow fields) and small thickets account for the vast majority of herbaceous vegetation in the project area. Most of these sites are dominated by plants indicative of early successional habitats including some non-native species. Early successional areas with naturalized vegetation contain herbaceous species like American burnweed, annual ragweed, beefsteak plant, broomsedge bluestem, dog fennel, great ragweed, ironweed, Johnson grass, marsh bristle grass, rough cocklebur, sericea lespedeza, Spanish needles, tall goldenrod, wingstem, and yellow bristle grass.

Deciduous forest is characterized by trees with overlapping crowns where deciduous species account for more than 75 percent of the canopy cover. In the proposed project area, common overstory species include black walnut, Chinkapin oak, honey locust, red cedar, scarlet oak, shagbark hickory, slippery elm, southern red oak, and sugar maple with the bulk of trees consisting of Osage orange, southern hackberry, and white ash. The understory is comprised mostly of Amur honeysuckle and Chinese privet with scattered populations of coralberry, hardy orange, and multiflora rose. Herbaceous plants and woody vines observed include crossvine, dead nettle, devil's grandmother, Japanese honeysuckle, Japanese stiltgrass, roundleaf greenbrier, Virginia wild rye, white avens, white snakeroot, and winter creeper. Deciduous forests in the project area have trees that average between 6 and 20 inches diameter at breast height.

Executive Order 13112 serves to prevent the introduction of invasive species and provides for their control to minimize the economic, ecological, and human health impacts that those species potentially cause. In this context, invasive species are nonnative species that invade natural areas, displace native species, and degrade ecological communities or ecosystem processes (Miller et al. 2010). No federal-noxious weeds were observed in the project area, but several high priority invasive plants were observed in the project area (Table 3-4). During the field surveys, invasive plants were observed in both forest and herbaceous vegetation types, but forested areas generally contained both greater numbers and cover of nonnative, invasive plant species. Six non-native plant species considered to be a severe threat to native plant communities in Tennessee were observed in the project area (Tennessee Invasive Plant Council 2009).

Common Name	Scientific Name
Sericea Lespedeza	Lespedeza cuneata
Chinese Privet	Ligustrum sinense
Japanese Honeysuckle	Lonicera japonica
Japanese Stilitgrass	Microstegium vimineum
Multiflora Rose	Rosa multiflora
Johnson Grass	Sorghum halepense

# Table 3-4.Severe Threat Invasive Plant Species Observed in<br/>the Proposed Gallatin Borrow Site

# 3.7.2 Environmental Consequences

## 3.7.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, areas within the proposed borrow site would remain in their current condition. Thus, adoption of the No Action Alternative would not affect plant life because no project-related work would occur. Changes to local plant communities resulting from natural ecological processes and human-related disturbance would continue to occur, but the changes would not result from the proposed project. Therefore, there would be no impacts to plant life under the No Action Alternative.

## 3.7.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

Adoption of the Action Alternative would not significantly affect the vegetative terrestrial ecology of the region. Adoption of this alternative would require clearing of approximately 37 acres of forested land. Virtually all forests in the project area have been previously cleared and the plant communities found there are common and well represented throughout the region. As of 2014, there were well over 527,000 acres of forest land in Sumner and the surrounding Tennessee counties and two bordering Kentucky counties (USFS 2016), and more than 16,000 acres of forest lands within the project vicinity (see Table 3-3). Therefore, project-related effects to forest resources would be minor when compared to the total amount of forest land occurring in the region.

It is likely that project related construction would result in localized increases of invasive plants, but the plants most likely to colonize the area are distributed widely throughout the region and implementation of the proposed project would not change this situation. Effects would be further reduced because revegetation of the site would be accomplished using native or non-invasive species as outlined in *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA 2017a).

# 3.8 Wildlife

## 3.8.1 Affected Environment

The proposed borrow site project area is a 198-acre site comprised of approximately 47 acres of deciduous forested habitat and approximately 149 acres of fallow (previously cultivated) and herbaceous fields (see Table 3-3).

Field surveys of the site were performed on January 23 and 25, 2018. Several common birds found in deciduous forested fragments in this region include the American crow, American goldfinch, blue jay, Carolina chickadee, downy woodpecker, eastern phoebe, eastern towhee, norther cardinal, red-bellied woodpecker, red-tailed hawk, summer tanager, tufted titmouse, wood thrush, wild turkey, and yellow-billed cuckoo (National Geographic, 2002). This area also provides foraging and roosting habitat for several species of bat, particularly in areas where the forest understory is partially open. Bat species likely found within this habitat include big brown bat, eastern red bat, evening bat, silver-haired bat, and tricolored bat. Eastern chipmunk, eastern gray squirrel, and gray fox are other mammals likely to occur in this habitat in this region (Whitaker 1996). Eastern box turtle, eastern fence lizard, gray ratsnake, and northern ring-necked snake are common reptiles of deciduous forests in this region (Powell et al. 2016).

Herbaceous vegetation, dominated by early successional habitats within the borrow site project area provide habitat for common bird species, such as Canada goose, eastern meadowlark, European starling, killdeer, field sparrow, song sparrow, indigo bunting, wild turkey, red-winged blackbird, Carolina wren, and mourning dove (National Geographic 2002). White-tailed deer, eastern cottontail, striped skunk, and rodents such as the white-footed mouse are also frequently associated with early successional habitats (Whitaker 1996). Reptiles found in these habitats include southern black racer, gray rat snake, and eastern garter snake (Powell et al. 2016).

Riparian habitats also occur within the project areas in and along streams. Such habitat provides resources for birds, including Acadian flycatcher, northern harrier, prothonotary warbler, red-winged blackbird, song sparrow, swamp sparrow, and white-throated sparrow (National Geographic 2002). North American deermouse and smoky shrew are common mammals of palustrine wetland and aquatic communities (Natureserve 2017 and Whittaker 1996). Midwestern worm snake, ringneck snake, rough green snake, and timber rattlesnake, are common reptiles likely present within this habitat (Dorcas and Gibbons 2005, Scott and Redmond 2008). Amphibians likely found in forested wetlands in this area include marbled, northern slimy salamander, and spotted salamander, eastern narrowmouth toad, eastern spadefoot toad, Fowler's toad, gray treefrog, and southern leopard frog (Conant and Collins 1998, Scott and Redmond 1996).

Review of the TVA Regional Natural Heritage database on January 3, 2018, resulted in records for five caves within 3 miles of the project footprint. The closest record of a cave is approximately 1.0 mile from the project footprint. No new caves were found during field reviews on January 23 and 25, 2018. No other unique terrestrial habitat is known from within 3 miles of the project area.

Review of the USFWS's Information for Planning and Consultation (IPaC) database (<u>https://ecos.fws.gov/ipac/)</u> resulted in identification of eight migratory birds of conservation concern that have the potential to be impacted by the proposed actions: blue-winged warbler, Kentucky warbler, lesser yellow legs, prairie warbler, red-headed woodpecker, rusty blackbird, semi-palmated sandpiper, and wood thrush. Of these species, the project footprint offers approximately 135 acres of former agricultural and herbaceous fields for blue winged warbler and prairie warbler, 128 acres for Kentucky warbler, red-headed woodpecker, rusty blackbird, and wood thrush, and less than 1 acre for semi-palmated sandpiper. Two records of colonial wading bird colonies exist within 3 miles of the borrow site project area. The nearest viable record is approximately 1.1 miles from the borrow site project area. No aggregations of birds or colonial wading bird colonies were documented within the borrow site project area during the January 2018 field visits.

## 3.8.2 Environmental Consequences

## 3.8.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, the borrow site would not be developed. No clearing or excavation would be performed. Trees and other vegetation would remain in place in their current state. Therefore, no impacts to wildlife would occur under this alternative.

#### 3.8.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

Under the Alternative B, TVA would develop the borrow site and construct a new haul road from the borrow site to Steam Plant Road. The project would involve removal of trees and other vegetation within the identified limits of disturbance. Under this alternative, vegetation removal would occur on up to 139.4 acres of early successional, herbaceous habitat and up to 37.3 acres of forested habitat. Direct effects to common wildlife may occur to some individuals that may be immobile during the time of project activities (i.e. juveniles or eggs). This could be the case if project activities took place during breeding/nesting seasons. These impacts would be minimized in forested areas by restriction of clearing activities to the period between August 1 and March 31. However, the actions are not likely to affect populations of species common to the area, as similar forested totaling approximately 13,606 acres and approximately 2,950 acres of agricultural field habitat exists in the surrounding landscape (see Table 3-3).

Based on the small amount of fragmented habitat and the existing wide-scale disturbance in the areas immediately adjacent to the project area, populations of migratory birds identified by USFWS as of conservation concern are not likely to inhabit the proposed action area. No active, documented osprey nests or heronries are known within 660 feet of the borrow site project area or would be impacted by the development or operation of the borrow site. Migratory bird populations of conservation concern are not likely to be impacted by the proposed actions. Therefore, impacts to wildlife are considered to be minor under this alternative.

# 3.9 Threatened and Endangered Species

## 3.9.1 Affected Environment

The Endangered Species Act (ESA) 16 United States Code [USC] §§ 1531-1544 was enacted to conserve the ecosystems upon which endangered and threatened species depend, and to conserve and recover those species. An endangered species is defined by the ESA as any species in danger of extinction throughout all or a significant portion of its range. Likewise, a threatened species is likely to become endangered within the foreseeable future throughout all or a significant part of its range. Critical habitats, essential to the conservation of listed species, also can be designated under the ESA. The ESA establishes programs to conserve and recover endangered and threatened species and makes their conservation a priority for federal agencies. Section 7 of the ESA requires federal agencies to consult with the USFWS when their proposed actions may affect endangered or threatened species and their critical habitats.

The State of Tennessee provides protection for species considered threatened, endangered or deemed in need of management within the state other than those already federally listed under the ESA. Plant species are protected in Tennessee through the Rare Plant Protection and Conservation Act of 1985. The listing of species is managed by the TDEC. Additionally, TVA also maintains databases of aquatic and terrestrial animal and plant species that are considered threatened, endangered, of special concern, or are otherwise tracked in Tennessee because the species is rare and/or vulnerable within the state.

A review of the USFWS IPaC tool and the TVA Regional Natural Heritage database for species of conservation concern potentially present within the project area was conducted in February 2018, and the results of that review are listed in Table 3-5.

## 3.9.1.1 Wildlife

A review of the TVA Regional Heritage database and USFWS IPaC tool on February 2018 resulted in records for three state-listed species (Allegheny woodrat, Bewick's wren, streamside salamander), three records of a federally listed species (gray bat, Indiana bat, northern long-eared bat), and one record of a federally protected species (bald eagle) within three miles of the project footprint (Table 3-5).

Allegheny woodrat is associated with rock outcroppings, rocky cliffs, talus slopes with boulders and crevices. This species is also known from cave habitat, especially when found in a mixed conifer-hardwood forest. Mast producing trees provide an important food source for Allegheny woodrat (TWRA 2018). Their diet also consists of fruits, seeds, grasses, and fungi. The closest record of Allegheny woodrat is approximately 0.5 miles away from the project footprint. Five caves have been recorded within 3 miles of the project footprint. No new caves were found during field reviews on January 23 and 25, 2018. No suitable habitat for Allegheny woodrat exists within the project footprint.

Bewick's wren utilizes brushy areas, thickets in open country, and open woodlands. This species often builds nests within cavities of trees, as well as on ledges that are within 30 feet of the ground. Common nest sites include rock crevices, brush piles, outbuildings, abandoned woodpecker nest cavities, and abandoned automobiles. (The Cornell Lab of Ornithology 2018). The closest record of Bewick's wren is approximately 3.0 miles from the project footprint. However, the nearby records of this species are historical. Current range maps suggest this species no longer occurs in Sumner County (NatureServe 2017). Should migrants or other individuals be found using the area, their presence would likely be temporary as no breeding pairs have been documented in the TVA database in this location since 1980. While suitable habitat for Bewick's wren exists within the project footprint, it is not anticipated to occur in the project area.

Streamside salamander is found in scattered populations in Middle Tennessee, particularly in limestone habitats. This species is most often found in upland forests close to streams (TWRA 2018). Streamside salamander can be differentiated from small-mouthed salamander by habitat use. Streamside salamanders do not inhabit pools and ditches like small-mouthed salamanders. The closest record of a streamside salamander is approximately 2.4 miles from the project footprint. Habitat for streamside salamander exists within the project footprint along streams that flow over limestone bedrock and boulders.

Bald eagles are protected under the Bald and Golden Eagle Protection Act (USFWS 2013). This species is associated with larger mature trees capable of supporting its massive nests. These are usually found near larger waterways where the eagles forage (Turcotte and Watts 1999). The nearest bald eagle nesting record is approximately 2.7 miles away from the project footprint, however, this nest is no longer intact. The most recent sighting of this nest was in 2012 when it was only partially intact. No bald eagles or their nests were observed in or near the project footprint during field reviews performed on January 23 and 25, 2018. Foraging habitat for bald eagle exists over the Cumberland River.

		Status		Suitable	
Common Name	Scientific Name	Federal <sup>1</sup>	State <sup>2</sup> (Rank <sup>3</sup> )	Habitat Present Onsite⁴	
Amphibians					
Streamside	Ambystoma barbouri		D (S2)	Y	
Salamander					
Birds					
Bald Eagle	Haliaeetus leucocephalus	DM	D (S3)	Y	
Bewick's Wren	Thryomanes bewickii		E (S1)	Y	
Mammals					
Allegheny Woodrat	Neotoma magister		D (S3)	Ν	
Gray Bat	Myotis grisescens	LE	E (S2)	Y	
Indiana Bat	Myotis sodalist	LE	E (S1)	Y	
Northern Long-eared	-		S1S2	Y	
Bat	Myotis septentrionalis	LT			
Plants					
Leafy Prairie-Clover	Dalea foliosa		S2S3	Ν	
Fish					
Bedrock Shiner	Notropis rupestris		D (S2)	N	
Backfin Sucker	Thoburnia atripinnis		D (S2)	Ν	
Flame Chub	Hemitremia flammea		D (S3)	Ν	
Frecklebelly Darter	Percina strictogaster		D (S1)	Ν	
Lake Sturgeon	Acipenser fulvescens		E (S1)	N	
Orangefin Darter	Etheostoma bellum		D (S3)	N	
Slenderhead Darter	Percina phoxocephala		D (S3)	N	
Splendid Darter	Etheostoma barrenense		D (S3)	N	
Teardrop Darter	Eheostoma barbouri		D (S2)	Ν	
Mollusks			· · /		
Pink mucket	Lampsilis abrupta	LE	E (S2)	Ν	
Ornate Rocksnail	Lithasia geniculata		S2 <sup>′</sup>	Ν	
Sources: TVA Natural Heritag	ge Database 2018 and USFWS	IPaC 2018			

Table 3-5.	Sensitive Species within the Project Vicinity
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<sup>1</sup> Federal Status Codes:

DM = Delisted, Recovered, and Being Monitored	LE = Listed Endangered
LT = Listed Threatened;	= Not Listed by USFWS
<sup>2</sup> State Status Codes:	-
E = listed endangered	S = species of special concern
T = listed threatened	Rare = rare, but not state listed
<sup>3</sup> State Rank:	
S1 = critically imperiled	S2 = imperiled S3 = vulnerable S4 = apparently
secure	

S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2) <sup>4</sup> Habitat Codes:

Y = Yes, species has been documented in existing habitats in study area and suitable habitat is present

N = No, no records of species within study area and no suitable habitat is present

P = Potentially suitable habitat is present, but no records of species in study area

\* Species documented within 3 miles (wildlife) 5 miles (plants) of GAF by the TVA Natural Heritage Database.

Gray bat inhabits caves throughout the year, migrating among different caves across seasons (Brady et al. 1982, Tuttle 1976). During summer, bats disperse from colonies at dusk to forage for insects over streams, rivers and reservoirs (Harvey 1992). The nearest gray bat record occurs approximately 2.7 miles from the project footprint. Five caves have been recorded within 3 miles of the project footprint, the closest being approximately

1.0 mile away. No new caves or other roosting habitat for gray bat have been documented within 3.0 miles of the project footprint and none was observed in the action area during field reviews on January 23 and 25, 2018. Drinking water and foraging habitat for gray bat exists over the Cumberland River near the vicinity of the project footprint as well as a small pond, stream, and wetlands within the project footprint.

Indiana bat hibernates in caves during winter and inhabit forest areas around these caves for swarming (mating) in the fall and staging in the spring, prior to migration to summer habitat. During summer, Indiana bats roost under exfoliating bark, and within cracks and crevices of trees in mature forests with an open understory often near sources of water. Indiana bats are known to change roost trees frequently throughout the season, yet still maintain site fidelity, returning to the same summer roosting areas in subsequent years (Pruitt and TeWinkel 2007, Kurta et al. 2002, USFWS 2017). Although Sumner County, Tennessee is within the range of this species, no records of this species are known from this county. Five caves have been documented within a three-mile radius of the project footprint, the closest being approximately 1.0 mile from the project footprint. No new caves or other suitable winter roosting habitat was observed in the project footprint during field reviews on January 23 and 25, 2018. Drinking water and foraging habitat for Indiana bat exists over the Cumberland River near the vicinity of the project footprint as well as a small pond and several small streams within the project footprint. Foraging habitat for Indiana bat also exists above tree canopies and along forested edges within the project footprint.

The northern long-eared bat (NLEB) predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring, they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees. Roost selection by NLEB is similar to Indiana bat; however, it is thought that NLEBs are more opportunistic in roost site selection. This species also is known to roost in abandoned buildings and under bridges. NLEBs emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (Harvey et al. 2011; USFWS 2014: USFWS 2017). The closest known record of NLEB is approximately 14.7 miles from the project footprint. Five caves have been documented within a 3-mile radius of the project footprint, the closest being 1.0 mile from the project footprint. No new caves or other suitable winter roosting habitat were observed in the project footprint during field reviews on January 23 and 25, 2018. Drinking water for NELB exists in the Cumberland River in the vicinity of the project footprint, as well as a pond and several, small streams. Foraging habitat for NLEB also exists under forested canopies within the project footprint.

Habitat assessment surveys for Indiana bat and NLEB were performed on January 23 and 25, 2018, using the USFW 2017 Range-wide Indiana bat Summer Survey Guidelines. Within the project footprint, approximately 37 acres were identified as potential suitable summer roosting habitat for Indiana bat and NLEB. The two dilapidated structures proposed for removal may offer temporary roosts for individual transient bats during foraging or migration. Due to their structure, they are not suitable for maternity roosting bats. There was no evidence of bat use in these structures during field reviews.

## 3.9.1.2 Plants

Review of the TVA Natural Heritage Database indicates that no state and no federally listed plant species have been previously reported within a 5-mile vicinity of the project area. One federally endangered plant species, leafy prairie-clover, is known from Sumner County, Tennessee (see Table 3-5), the county where the project resides. No designated critical habitat for this plant occurs in the project area. The borrow site has been heavily disturbed by previous and current land use and is populated with common plant species. Aerial photos, topographic maps, knowledge of rare plant habitats, and the January 2018 field surveys found no state-listed and no federally listed plant species in the project area. Habitat for leafy prairie-clover consists of rocky washes in limestone glades and prairies and this habitat type was also not found within the proposed project area.

## 3.9.1.3 Aquatic Species

A review of the TVA Natural Heritage Database and the USFWS IPaC database indicated one federally listed aquatic species (one mussel) and ten additional state-listed aquatic species (nine fishes, and one snail) within the Cumberland River 10-digit HUC watershed 0513020106, a 10-mile radius of the proposed project area, and/or within Sumner County, Tennessee. The federally listed pink mucket is found in both the Tennessee and Cumberland River drainages (Etnier and Starnes 1993, Parmalee and Bogan 1998), and would not occur in streams potentially affected by the proposed project, which are part of Cumberland River drainage. Suitable habitat for the state-listed aquatic species listed in Table 3-5 was not observed within the soil borrow site.

The pink mucket is the only federally listed species identified as potentially occurring within a 10-mile radius of the project area. The pink mucket is typically a big river species that is found in both the Tennessee and Cumberland River systems. Pink muckets prefer shallow riffles with a hard rocky bottom (Parmalee and Bogan 1998). Pink muckets are federally endangered and are a species of great concern in the Tennessee River System.

## 3.9.2 Environmental Consequences

## 3.9.2.1 Alternative A: No Action Alternative

Under the No Action alternative, no development of the borrow site would be initiated. Within the project site, no tree clearing or excavation of soil would be performed and vegetation would remain in its current state. Therefore, the implementation of the No Action alternative would not impact threatened and endangered species within the proposed project area.

## 3.9.2.2 Alternative B: Development of Borrow Site

Under Alternative B, TVA would develop the borrow site and construct a new haul road from the site to Steam Plant Road. The project would involve removal of trees and other vegetation, and building a new road that would require a culvert to be installed in a stream.

No suitable habitat for the Allegheny woodrat and bald eagle were found within the project footprint. Suitable foraging habitat for bald eagle occurs over the Cumberland River. However, the proposed project area would not impact the river and food source for bald

eagles. Therefore, proposed activities would not have any measurable effects on the Allegheny woodrat or bald eagle.

Habitat for streamside salamander exists along perennial streams within the project footprint that contain limestone bedrock and boulders. Field surveys for streamside salamander were performed jointly by subject matter experts from TDEC and TVA on March 22, 2018. No individuals or egg masses of this species were found despite the presence of suitable habitat along the perennial stream. WWCs may provide travel corridors but are unlikely to provide suitable breeding grounds for the species due to lack of sufficient water flow for long enough periods of time. These field survey results were provided to Robert Todd of Tennessee Wildlife Resources Agency (TWRA) after which he determined no adverse impacts to state-listed species under TWRA's authority are anticipated. Despite negative survey results, TVA would use BMPs along all remaining streams and wet weather conveyances onsite to minimize impacts. In conjunction with any potential impacts to streams TVA would avoid and minimize impacts during design to the extent practicable, implement appropriate BMPs, and compensate for unavoidable adverse effects.

Proposed actions would impact some areas of existing streams and a pond used for foraging and drinking water by gray bats, Indiana bats, and NLEBs. Removal of approximately 37 acres of forested habitat in the proposed action area would also remove additional foraging habitat for Indiana bat and NLEB. As previously mentioned no evidence of bat use was found in the dilapidated structures and use of these structures would likely only be temporary for transient bats migrating or foraging through the area.

The proposed action includes the removal of approximately 37 acres of forest. As part of TVA's ESA Section 7 programmatic biological assessment for bats, TVA programmatically quantified and minimized removal of potentially suitable summer roosting habitat during time of potential occupancy by Indiana bat and northern long-eared bat. No documented Indiana bat or NLEB roosts occur within 10 miles of the project. Accordingly, TVA would track and document the amount and timing of tree removal of potentially suitable roost trees and include these acreages in annual reporting to the USFWS in accordance with the bat programmatic opinion issued to TVA in April 2018 (USFWS 2018). Additionally, if removal of suitable bat roost tree habitat needs to be removed when bats may be present on the landscape, TVA would set aside funding to be applied towards future bat-specific conservation projects. TVA currently plans to conduct the tree removal between August 1 and March 31. Only limited tree removal would occur during the period from August 1 to October 1, and the majority of the tree removal would be conducted between October 1 and March 31. No tree removal would occur between June 1 and July 31 to avoid any potential direct impact to juvenile bats at a time when they are unable to fly. The majority of tree removal is expected to occur between October 15 and March 31, when bats are not on the landscape.

A number of activities associated with the proposed action, including tree clearing, were addressed in TVA's programmatic biological assessment on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) (USFWS 2018). For those activities with potential to affect bats, TVA committed to implementing specific conservation measures to avoid or minimize impacts to bats. Therefore, direct and indirect impacts to federally-listed bat species are expected to be minor. These activities and associated conservation measures are identified in TVA's Bat Strategy Project Assessment (Appendix C).

There would be no impact for state-listed plant species and the federally endangered leafy prairie-clover because field surveys indicate no suitable habitat occurs within the proposed project area. Furthermore, no rare plants were observed within the project area during field surveys. Therefore, adoption of the Alternative B would have no impact on the leafy prairie-clover.

Aquatic biota could be affected by the proposed action either directly by the alteration of habitat conditions or indirectly due to modification of stream flow characteristics. However, no suitable habitat was documented within the streams on the project site for the species listed in Table 3-5. Additionally, no federally designated critical habitat is known from the potentially affected 10-digit HUC watershed of the proposed project area. Therefore, no impacts would occur to aquatic threatened or endangered species or their habitats as a result of the construction and operation of the GAF borrow site.

Under Alternative B, no impacts to threatened and endangered species are expected to occur to the species that do not have habitat requirements that overlap with the habitat present in the project area. Additionally, for those threatened and endangered species that do have suitable habitat in the project area (gray bats, Indiana bats, and NLEBs), no survey records have indicated that these species have historically occurred within the project limits and there were no sightings of these species during contemporary site visits. Therefore, no impacts to these species are expected under Alternative B. For summer roosting bat species including the Indiana bat and NLEB, tree clearing is expected to occur between August 1 and March 31. Therefore, direct impacts to roosting individuals of these species is expected to be avoided. Tree removal could result in indirect impacts to Indiana bat and NLEB through removal of suitable roost trees, and the potential to remove foraging habitat for listed bat species. Impacts to these species are within the bounds of impacts analyzed in TVA's Bat Strategy Programmatic Section 7 ESA consultation.

# 3.10 Wetlands

## 3.10.1 Affected Environment

The USACE regulates the discharge of fill material into waters of the United States, including wetlands, pursuant to Section 404 of the CWA (33 USC 1344). Additionally, EO 11990 (Protection of Wetlands) requires federal agencies to avoid, to the extent possible, adverse impacts to wetlands and to preserve and enhance their natural and beneficial values.

As defined in Section 404 of the CWA, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands and wetland fringe areas can also be found along the edges of many watercourses and impounded waters (both natural and man-made). Wetland habitat provides valuable public benefits including flood storage, erosion control, water quality improvement, wildlife habitat, and recreation opportunities.

The proposed borrow site is located in the Outer Nashville Basin Level IV Ecoregion. The Outer Nashville Basin is comprised of open, gently rolling to steep topography. Deciduous forest with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish (USEPA 2017). Vegetation types

observed during field surveys of the site conducted by TVA in January 2018 include a combination of deciduous forest, evergreen, mixed evergreen deciduous forest, and herbaceous vegetation.

Wetlands were identified on National Wetland Inventory maps within the borrow site project area, and fieldwork was conducted to confirm mapped resources, identify additional resources, and provide for more accurate mapping of those resources. A field survey team performed wetland and stream delineations within the proposed borrow site location in January 2018. The survey team consisted of two biologists with training and expertise in waters of the U.S. delineations and specific knowledge and expertise in local flora, fauna, and soils. Potential jurisdictional wetlands were evaluated in accordance with the Regional Supplement to the USACE Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0).

No wetland areas were identified within the proposed borrow site project limits. Several areas identified as former farm ponds were investigated during the survey. Each dry pond area had one or more sinkholes that effectively prevented soil saturation or inundation. No streams flowed into or out of these areas. (Wood 2018). The field survey identified seven WWCs/ephemeral streams, three perennial stream features, a spring and one pond within the proposed borrow site project area (see Section 3.5 and Figure 3-2).

## 3.10.1.1 Alternative A – No Action Alternative

Under the No Action Alternative, TVA would not develop the proposed borrow site. As a result, no new work would be conducted that could potentially alter project-related environmental conditions within the project area. Therefore, there would be no impacts to wetland resources with this alternative.

#### 3.10.1.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

No wetlands were identified during field surveys within the limits of the proposed borrow site. Therefore, there would be no impacts to wetland resources with this alternative. Indirect impacts to nearby jurisdictional or non-jurisdictional wetlands outside of the proposed project area could potentially result from the alteration of hydrologic inputs to the wetland system resulting from the removal of material from the borrow site as adjacent wetlands primarily receive their hydrology via diffuse surface flow and direct precipitation. The dewatering and modification of hydrology from the borrow site is expected to have a negligible effect on adjacent wetlands.

## 3.11 Visual Resources

## 3.11.1 Affected Environment

This assessment provides a review and classification of the visual attributes of existing scenery, along with the anticipated attributes resulting from the proposed action. The classification criteria used in this analysis are adapted from a scenic management system developed by the U.S. Forest Service (USFS) and integrated with planning methods used by TVA (USFS 1995). Potential visual impacts to cultural and historic resources are not included in this analysis as they are assessed separately in Section 3.12.

The visual landscape of an area is formed by physical, biological and man-made features that combine to influence both landscape identifiability and uniqueness. The scenic value a particular landscape is evaluated based on several factors that include scenic attractiveness, scenic integrity and visibility. Scenic attractiveness is a measure of scenic

quality based on human perceptions of intrinsic beauty as expressed in the forms, colors, textures and visual composition of each landscape. Scenic attractiveness is expressed as one of the following three categories: distinctive, common, or minimal. Scenic integrity is a measure of scenic importance based on the degree of visual unity and wholeness of the natural landscape character. The scenic integrity of a site is classified as high, moderate, low, or very low. The subjective perceptions of a landscape's aesthetic quality and sense of place is dependent on where and how it is viewed.

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

The proposed borrow site consists of lands that are currently undeveloped. Land within the foreground is largely undeveloped with some pockets of rural residential development, forested land and agricultural fields. The City of Gallatin, the GAF facility and the Cumberland River are the primary features within the middleground and background distances.

The topography of the borrow site is level to gently rolling and slopes to the southwest towards the Cumberland River. Views of the project area would likely be up to distances in the foreground (0 feet to 0.5 mile) from local roads and other nearby residential areas. In the foreground, the viewshed includes trees, agricultural fields and rural residential properties. The composition of vegetation and the patterns of vegetation are the prominent features and consist of a variety of deciduous trees, and agricultural fields. Scenic attractiveness of the proposed borrow site is considered common, and scenic integrity is low because of land disturbance resulting from residential development, overhead transmission lines, and agricultural development.

The rating for scenic attractiveness is due to the ordinary or common visual quality. The forms, colors and textures in the affected environment are normally seen through the characteristic landscape. Therefore, the landscapes are not considered to have distinctive quality. In the foreground and middleground, the scenic integrity has been lowered by slight human alteration including agricultural, residential, commercial and industrial uses. However, in the background these alterations are not substantive enough to dominate the view of the landscape. The scenic class of a landscape is determined by combining the levels of scenic attractiveness, scenic integrity and visibility and can be excellent, good, fair, or poor. Based on the criteria used for this analysis, the overall scenic class for the affected environment is fair at the proposed borrow site.

## 3.11.2 Environmental Consequences

#### 3.11.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, the project would not be undertaken. As a result, the existing aesthetics of the project area would not change. The haul route used to transport borrow to GAF from existing offsite sources would utilize existing roadways which currently support truck traffic. Therefore, any small increase in visual discord as a result of additional trucks would not alter the overall visual landscape.

#### 3.11.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

The proposed borrow site would primarily be seen by a limited number of nearby residents and motorists on the adjacent roadway, Steam Plant Road. The development of the proposed borrow site would contrast with the existing color of the landscape. The current landscape at the proposed site is predominantly green and brown due to the existing vegetation on the site. While borrow is being obtained, the increase in personnel and equipment would contrast with the natural landscape color. The dominant shapes in the landscape include the vertical lines of forested areas as well as surrounding overhead transmission lines. The color and shape contrast would be greatest in the foreground to passing motorists and residents, although the contrasts would be less noticeable in the middleground and background.

The development of the borrow site would contribute to a change in visual integrity of the landscape due to construction and excavation activities, which impact the local viewshed. Development would be completed in phases and disturbed areas would be restricted to 50 acres or less at any given time. Scenic attractiveness may be reduced to minimal in the foreground during excavation, but would remain common in the middleground and background. Similarly, scenic integrity may be reduced to low in the foreground during excavation as deviations to the landscape character due to increased activity would dominate the landscape being viewed during the use of the borrow site. During this period, impacts to scenic integrity are anticipated to be greatest in the foreground for area residents and other passing motorists along local roads. However, existing tree lines along the property boundary would remain intact which would buffer the view of the borrow site from residents in the foreground. In addition, following the removal of all available soil from an active borrow area within the site, the area would be graded and stabilized, which could include seeding to support the establishment of native vegetation. In the middleground and background, impacts are not considered to be significant as they are not expected to alter the overall landscape; therefore, scenic integrity would remain moderate. Based on the USFS scenic management system criteria used for this analysis, the scenic value class for the affected environment is considered to be reduced to poor in the short term, but would remain fair in the long term. Therefore, it is not expected that the existing scenic class would be reduced by two or more levels, which is the threshold of significance of impact to the visual environment.

The haul route used to transport borrow to GAF would utilize an existing roadway which currently supports truck traffic. Any sensitive visual receptors along the haul route are already subjected to vehicular traffic destined for GAF. Consequently, the relatively small increase in visual discord associated with additional trucks on the roadway would not alter the overall landscape. Therefore, impacts to visual resources along the haul road to GAF are not anticipated.

# 3.12 Cultural and Historic Resources

## 3.12.1 Affected Environment

## 3.12.1.1 Regulatory Framework for Cultural Resources

Cultural resources or historic properties include prehistoric and historic archaeological sites, districts, buildings, structures, and objects as well as locations of important historic events. Federal agencies, including TVA, are required by the NHPA (54 USC 300101 et seq.) and by NEPA to consider the possible effects of their undertakings on historic properties. "Undertaking" means any project, activity, or program, and any of its elements, which has the potential to affect a historic property and is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency. An agency may fulfill its statutory obligations under NHPA by following the process outlined in the regulations implementing Section 106 of NHPA at 36 Code of Federal Regulations (CFR) Part 800. Additional cultural resource laws that protect historic resources include the Archaeological and Historic Preservation Act (54 USC 300101 et seq.), Archaeological Resources Protection Act (16 USC 470aa-470mm), and the Native American Graves Protection and Repatriation Act (25 USC 3001-3013).

Section 106 of the NHPA requires that federal agencies consider the potential effects of their actions on historic properties and allow the Advisory Council on Historic Preservation an opportunity to comment on the action. Section 106 involves four steps: (1) initiate the process, (2) identify historic properties, (3) assess adverse effects, and (4) resolve adverse effects. This process is carried out in consultation with the SHPO and other interested consulting parties, including federally recognized Indian tribes.

Cultural resources are considered historic properties if they are listed or eligible for listing in the NRHP. The NRHP eligibility of a resource is based on the Secretary of the Interior's criteria for evaluation (36 CFR 60.4), which state that significant cultural resources possess integrity of location, design, setting, materials, workmanship, feeling, association and:

- a. Are associated with events that have made a significant contribution to the broad patterns of our history; or
- b. Are associated with the lives of persons significant in our past; or
- c. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value; or
- d. Have yielded, or may yield, information (data) important in prehistory or history.

A project may have effects on a historic property that are not adverse if those effects do not diminish the qualities of the property that identify it as eligible for listing on the NRHP. However, if the agency determines (in consultation with the SHPO and tribes) that the undertaking's effect on a historic property within the area of potential effect (APE) would diminish any of the qualities that make the property eligible for the NRHP (based on the criteria for evaluation at 36 CFR Part 60.4 above), the effect is said to be adverse. Examples of adverse effects would be ground disturbing activity in an archaeological site or erecting structures within the viewshed of a historic building in such a way as to diminish the structure's integrity of feeling or setting.

Agencies are required to consult with SHPOs, tribes, and others throughout the Section 106 process and to document adverse effects to historic properties resulting from agency undertakings.

## 3.12.1.2 Area of Potential Affect

The APE is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.

TVA determined that the APE for direct effects on historic properties includes the proposed borrow site and an approximately 70-meter (270-foot) wide corridor centered on Steam Plant Road. The APE encompasses a total of approximately 251 acres. No buildings or other above-ground in tact structures would be removed as part of the project. Given the nature of the proposed undertaking, which does not include construction of any standing structures, TVA considers the undertaking not to be of a type with potential for indirect effects on aboveground properties that are included or eligible for inclusion in the NRHP.

## 3.12.1.3 Previous Studies

TVA performed an archaeological survey of the majority of the proposed borrow site (223 acres) in 2016. Background research, conducted prior to the field study indicated that no previously recorded archaeological sites, and no properties listed in the NRHP, are located within the APE. The field study included a pedestrian survey and systematic shovel testing, which were performed according to guidelines published by the TDEC, Division of Archaeology. The study identified three archaeological sites (40SU319 through 40SU321), a historic cemetery (Vinson Cemetery), four non-site locales (NS-1 through NS-4), and six isolated finds of prehistoric archaeological material. The archaeological sites include a late nineteenth through early twentieth century farmstead site associated with several standing structures (40SU319), a lithic scatter of undetermined age or cultural affiliation (40SU320), and an Early Archaic lithic scatter (40SU321). The Tennessee Division of Archaeology issued an archaeological site number to Vinson Cemetery (40SU322). Based on the survey findings TVA determined that none of these resources is eligible for inclusion in the NRHP. TVA consulted with the Tennessee SHPO and federally-recognized Indian tribes. In a letter dated April 11, 2016, the SHPO agreed with TVA's findings and determinations (Appendix D), and no tribe objected or raised concerns that required further action on TVA's part. Although the Vinson Cemetery is not eligible for the NRHP, TVA considers it to be an historic resource.

TVA conducted a second archaeological survey of the approximately 70-meter (270-foot) wide corridor centered on Steam Plant Road and a small section of the borrow site project area adjoining Steam Plant Road in 2018. This area encompasses approximately 27.7 acres. The survey identified two previously unrecorded historic archaeological sites, 40SU341 and 40SU342. Site SU341 is associated with the Walnut Grove Schoolhouse. Site 40SU342 is an early nineteenth to twentieth century site with an artifact scatter and pier stones, and is associated with a non-extant farm structure and potentially associated with a pre-1860 log structure. Based on the survey results TVA has determined both sites as potentially eligible for inclusion in the NRHP. The Tennessee SHPO concurred with TVA's determinations by letter dated May 14, 2018 (Appendix D). The Shawnee Tribe concurred and stated they had no issues or concerns by email sent on May 8, 2018 to TVA's Tribal Liaison (Appendix D).

## 3.12.2 Environmental Consequences

## 3.12.2.1 Alternative A – No Action Alternative

Implementation of Alternative A would require no new ground disturbance activities or changes to current operations. Therefore, no direct or indirect impacts to cultural resources would occur under Alternative A.

## 3.12.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

The proposed undertaking could result in adverse effects on sites 40SU341 and 40SU342, both of which are potentially eligible for the NRHP, and the Vinson Cemetery. Effects to these resources could include direct effects resulting from ground disturbing activities, or cumulative effects that would occur later in time due to erosion caused by project activities.

Although the Vinson Cemetery is not eligible for inclusion in the NRHP, TVA would take steps to avoid or minimize potential project effects on this resource. TVA proposes to avoid effects on the cemetery and both archaeological sites by placing construction fencing around them during all physical work in the borrow site, marking the locations of these resources on all project-related drawings, and keeping all mechanized equipment outside the boundaries of these resources. No mechanized equipment would be permitted within the boundaries of the three resources. Any vegetation removal within the boundaries would be performed by hand using hand tools, and cut vegetation would be removed from the site boundaries by hand or with the use of light-duty equipment. If human remains are encountered or accidentally uncovered by earthmoving activities, all activities within the immediate area would cease and the county coroner or medical examiner, a local law enforcement agency, and the state archaeologist's office would be notified at once (Tennessee Code Annotated 11-6-107d). TVA would add contact information for the county coroner or medical examiner, a local law enforcement agency, and the state achaeologist's office would be notified at once (Tennessee Code Annotated 11-6-107d). TVA would add contact information for the county coroner or medical examiner, a local law enforcement agency, and the state achaeologist's office would be notified at once (Tennessee Code Annotated 11-6-107d). TVA would add contact information for the county coroner or medical examiner, a local law enforcement agency, and the state archaeologist's office would be notified at once office to the site risk plan to facilitate adherence to this procedure.

TVA finds that, with these conditions on the work in the APE, the undertaking would result in no adverse effects on historic properties. TVA consulted with the SHPO and federallyrecognized Indian tribes (Cherokee Nation, Eastern Band of Cherokee Indians, United Keetoowah Band of Cherokee Indians in Oklahoma, The Chickasaw Nation, Muscogee (Creek) Nation of Oklahoma, Alabama-Quassarte Tribal Town, Kialegee Tribal Town, Thlopthlocco Tribal Town, Absentee Shawnee Tribe of Oklahoma, Eastern Shawnee Tribe of Oklahoma, and Shawnee Tribe) regarding this finding and the proposed avoidance measures. The SHPO concurred by letter dated May 14, 2018, and the Shawnee Tribe agreed by email sent on May 8, 2018 to TVA's Tribal Liaison (Appendix D).

# 3.13 Land Use

## 3.13.1 Affected Environment

The proposed borrow site is located in a rural area southeast of Gallatin, Sumner County, Tennessee near the GAF and Cumberland River. As summarized in Table 3-3 and shown in Figure 3-3, land within the proposed borrow site is primarily undeveloped and contains a mix of herbaceous fields and forested land. Surrounding uses include rural residential and undeveloped forested land to the north, south, east and west. The City of Gallatin is located approximately 1.5 miles to the north of the proposed borrow site and GAF is located approximately 1.5 miles south of the proposed borrow site.

As summarized in Table 3-3 and shown in Figure 3-4, land use within the vicinity (i.e., 5-mile radius around GAF) is dominated by undeveloped lands with various vegetative

cover types including: hay/pasture (18,273 acres or 30.6 percent), deciduous forest (13,606 acres or 22.8 percent), open water (6,975 acres or 11.7 percent), and cultivated crops (2,950 acres or 4.9 percent). Developed lands in the vicinity are associated with the non-industrial, residential uses in the City of Gallatin and the industrial uses of GAF.

## 3.13.2 Environmental Consequences

## 3.13.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, TVA would not develop a borrow site on TVA-owned property. Therefore, there would be no changes in land use.

## 3.13.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

The proposed borrow site would be developed on land that is primarily undeveloped and covered with various vegetation cover types (see Table 3-3). Project activities related to the borrow site would involve clearing, grubbing, grading, and excavation that would result in the temporary conversion of approximately 178 acres of undeveloped land for industrial use. The disturbance of undeveloped lands would be minor when compared to the abundance of undeveloped land within a 5-mile radius of the site (see Table 3-3). Upon completion of excavation activities, the borrow site would revert to non-industrial open space and be regraded and stabilized to re-establish herbaceous vegetation. Therefore, overall impacts to land use from the construction of the borrow site would be minor.

# 3.14 Prime Farmland

# 3.14.1 Affected Environment

The 1981 Farmland Protection Policy Act (FPPA) (7 CFR Part 658) requires all federal agencies to evaluate impacts to prime, state or locally important, and unique farmland prior to permanently converting the land to uses incompatible with agriculture. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops. These characteristics allow prime farmland soils to produce the highest yields with minimal expenditure of energy and economic resources. In general, prime farmland soils have an adequate and dependable water supply, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. Prime farmland soils are permeable to water and air, not excessively erodible or saturated for extended period, and are protected from frequent flooding.

Prime farmland soils within the proposed borrow site limit of disturbance and within a 5-mile radius of the project area are summarized in Table 3-6 and illustrated in Figures 3-5 and 3-6. Within the borrow site project area, approximately 92.8 acres (52.1 percent of the project area) are considered prime farmland soils. Prime farmland within the borrow site project area consists of Harpeth silt loam. Overall, the prime farmland soils within the proposed borrow site project area comprise 0.5 percent of the total prime farmland soils found within a 5-mile radius of the project area.

Soil Type	Project Area (acres)	5-mile Radius (acres)
All prime farmland soils	92.8	18,487.2
Prime farmland if drained		5.5
Not prime farmland	85.3	41,143.4
Total	178.1	59,636.1

Source: USDA NRCS 2017



Figure 3-5. Prime Farmland Soils on the Proposed Borrow Site Project Area



#### Figure 3-6. Prime Farmland Within the Vicinity of the Borrow Site Project Area

## 3.14.2 Environmental Consequences

#### 3.14.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, no excavations would occur in conjunction with development of the borrow site; therefore, there would be no impacts to prime farmland soils. Borrow would be obtained, when needed, from one or more previously permitted commercial sites within 30 miles of GAF. Impacts to prime farmland would not be expected as these sites' permitted use is already designated for borrow development. Therefore, would be no impacts to prime farmland soils

#### 3.14.2.2 Alternative B – Develop and Operate a Borrow Site on TVA Owned Property

The proposed borrow site would impact approximately 92.8 acres of prime farmland soils. The loss of lands mapped as prime farmland and the subsequent loss of productivity to industrial use is minor when compared to the amount of land designated as prime farmland within the surrounding region. Therefore, the impact to prime farmland would be minor.

Per the FPPA manual (523.11, C., viii), surface mining where restoration is planned is not subject to the provisions of the FPPA. Therefore, no further coordination with the NRCS is needed.

# 3.15 Managed and Natural Areas

## 3.15.1 Affected Environment

Natural areas include managed areas, ecologically significant sites, and Nationwide Rivers Inventory (NRI) streams. Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, National Park Service, USFS, state or county) to protect and maintain certain ecological and/or recreational features. Ecologically significant sites are tracts of privately owned land that are recognized by resource biologists as having environmental resources or identified tracts on TVA lands that are ecologically significant, but not specifically managed by TVA's Natural Areas Program. The NRI is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more outstandingly remarkable natural or cultural values judged to be of more than local or regional significance.

This section addresses natural and managed areas that are on, immediately adjacent to (within 0.5 mile), or within the vicinity of the borrow site project area (5-mile radius). As noted in Table 3-7 and illustrated on Figure 3-7, several natural and managed areas are located within 5 miles of GAF.

Natural Area	Managing Agency	Distance From the Proposed Borrow Site
Bledsoe Creek NRI Segment	National Park Service	3 miles
Cragfont Farm Conservation Easement – Land Trust of Tennessee	Private Ownership	5 miles
Gallatin Steam Plant Heronry Protection Planning Site	TDEC	1 mile
Gallatin Steam Plant Wildlife Management Area	Tennessee Wildlife Resources Agency	0.3 mile
Merryman Farm Conservation Easement – Land Trust of Tennessee	Private Ownership	4.5 miles
Old Hickory Reservoir Reservation	U.S. Army Corps of Engineers	0.5 mile
Old Hickory State Wildlife Management Area	Tennessee Wildlife Resources Agency	0.5 mile

#### Table 3-7. Natural and Managed Areas Within 5 Miles of the Project Area

Source: TVA 2018



Figure 3-7. Natural Areas, and Recreation Resources and Community Facilities Within 5 miles of the Borrow Site Project Area

Bledsoe Creek is designated by the National Park Service as an NRI from the community of Bethpage in the north to where the creek empties into Old Hickory Reservoir, approximately 3 miles east of the proposed borrow site. This portion of Bledsoe Creek is noted for its cultural, historic, geologic, recreational, scenic, and wildlife value (NPS 2018).

Cragfont Farm and Merryman Farm are lands held in private ownership that have conservation easements with the Land Trust of Tennessee. These conservation easements are voluntary contracts that restrict development on these properties in perpetuity.

The Gallatin Steam Plant Heronry is an ecologically significant site located on a small island in the Old Hickory Reservoir, approximately 1 mile south of the proposed borrow site. This site has historically been utilized by great blue herons for a nesting colony, but is not currently used.

Approximately 250 acres of the GAF reservation are managed by TWRA as the Gallatin Steam Plant WMA. The WMA is located approximately 0.3 mile southeast of the proposed borrow site and adjacent to the haul route. Deer and turkey can be hunted with archery equipment only in certain areas of the WMA (TWRA 2017).

The Old Hickory Reservoir Reservation, also known as Old Hickory Lake, is managed by the USACE and is located on the Cumberland River from the Old Hickory Dam upstream to Cordell Hull Lock and Dam. This reservoir is adjacent to GAF and approximately 0.5 mile south of the proposed borrow site. A variety of outdoor recreation activities, including camping, hiking, hunting, fishing, boating, and wildlife observation are available on and near Old Hickory Reservoir Reservation (USACE 2018).

The Old Hickory State WMA consists of 6,000 acres of land along the shoreline of Old Hickory Reservoir and adjacent to GAF. This WMA is managed by TWRA for small game, large game, and waterfowl. Outdoor recreation activities, including hunting, fishing, and wildlife observation are available (TWRA 2017).

## 3.15.2 Environmental Consequences

#### 3.15.2.1 Alternative A – No Action Alternative

Under Alternative A, TVA would not develop a borrow site on TVA owned property. As borrow material would be needed to support future projects at GAF, TVA would obtain borrow material from one or more previously permitted commercial sites within 30 miles of GAF. Given the number of natural and managed areas in the surrounding area, it is possible that indirect impacts to natural and managed areas could occur due to the additional truck traffic, noise and dust from the trucks transporting borrow material to GAF. However, roadways used to transport borrow to and from the plant currently support truck traffic. Therefore, this impact would be minor and would not impact the use or enjoyment of these areas given the temporary and intermittent use of borrow and the preferred use of existing arterial or interstate roadways that currently support truck traffic to transport borrow material.

#### 3.15.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

There are no natural or managed areas located within the proposed borrow site. As such, there would be no direct impacts under this alternative. The Gallatin Steam Plant WMA, Old Hickory Reservoir, and Old Hickory WMA are located within 0.5 mile of the proposed borrow haul route. The additional truck traffic, noise and dust from the transport of borrow to GAF may indirectly impact these areas. However, traffic along the haul route is

characterized by truck traffic to and from the plant and considering the temporary and intermittent nature of the proposed action and relatively low number of trucks anticipated to be used to transport borrow material, impacts to these natural areas are anticipated to be minor and would not impact the use or enjoyment of these areas.

# 3.16 Parks and Recreation

# 3.16.1 Affected Environment

Parks and recreation facilities include open areas, boat ramps, community centers, swimming pools, and other public places. This section addresses parks and recreation facilities that are on, immediately adjacent to (within 0.5 mile), or within the vicinity of the project areas (5-mile radius). Parks and recreation facilities within the vicinity of the project areas are illustrated on Figure 3-7.

GAF is located on the Cumberland River, a major waterway that is characterized by frequent barge traffic and tow operations. The proposed borrow site is located approximately 0.5 mile north of Old Hickory Lake. Old Hickory Lake is a reservoir on the Cumberland River created by the Old Hickory Dam located at Cumberland River Mile 216.2, approximately 25 miles upstream of GAF (USACE 2016). The shoreline and waters of the lake receives heavy outdoor recreation activity including boating, fishing, camping, picnicking, and swimming. Several developed public and commercial recreation areas are located in the general vicinity of the Lake. Major developed areas and their approximate location relative to the proposed borrow site are listed in Table 3-8.

Developed Recreation Area	Distance from the Proposed Borrow Site
Bledsoe Creek State Park	3 miles
Bull Creek Public Boat Ramp	0.5 mile
Camp Boxwell Boy Scout Reservation	2.5 miles
Cherokee Marina	1.5 miles
Clearview Park	3.4 miles
Gallatin Marina	3 miles
Lock 4 Park (Sumner County Park)	3 miles
Martha Gallatin Boat Ramp	1.5 miles
Municipal Park	3.1 miles
Thompson Park	2.5 miles
Triple Creek Park	3.4 miles

## Table 3-8. Recreation Resources Within 5 Miles of the Proposed Borrow Site

Bledsoe Creek State Park is located approximately 3 miles north of the proposed borrow site. This approximately 169-acre park is located along Old Hickory Lake and offers outdoor recreation opportunities like camping, fishing, boating, and hiking (Tennessee State Parks 2018).

The 1,100-acre Camp Boxwell Boy Scout Reservation is located approximately 2.5 miles southwest of the proposed borrow site. Camp Boxwell provides outdoor recreation, such as camping, hiking, swimming, and fishing to Boy Scout troops (MTCBSA 2018).

Clearview Park, Municipal Park, and Thompson Park are community parks in Gallatin, Tennessee, located 2.5 to 3.4 miles northwest of the proposed project area. These parks provide ball fields, playgrounds, picnic areas, and walking paths (City of Gallatin 2018).

Lock 4 Park, also called Sumner County Park, is located approximately 2.4 miles west of the proposed borrow site along the shoreline of Old Hickory Reservoir. This park provides boat ramps, biking trails, fishing, and picnic areas (City of Gallatin 2018).

Triple Creek Park, located 3.4 miles north of the proposed borrow site, is the largest park in Gallatin, Tennessee. This park encompasses 185 acres and offers sports complexes, dog parks, walking trails, playgrounds, and picnic pavilions (City of Gallatin 2018).

## 3.16.2 Environmental Consequences

## 3.16.2.1 Alternative A – No Action Alternative

Under this alternative, the borrow site work would not be conducted and outdoor recreational use patterns in the general vicinity of the project would continue unchanged. Given the number of parks and recreational facilities in the surrounding area, it is possible that indirect impacts could occur as a result of additional truck traffic, noise and dust from the transport of borrow to GAF. However, this impact would be minor and would not impact the use or enjoyment of these areas given the temporary and intermittent use of borrow and the preferred use of existing arterial or interstate roadways to transport borrow material.

## 3.16.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

The proposed borrow site is situated about 0.5 mile from the shoreline of Old Hickory Lake. Because the project is not immediately adjacent to the shoreline and considering the relatively short and intermittent nature of borrow activities and the absence of any alteration in access to or capacity for recreational use, no impacts on Old Hickory recreation areas or recreation activities are expected. Likewise, public parks located off the reservoir, such as Thompson Park, would not be impacted due to their distance from the project. There are no public park or recreational facilities along the haul route from the proposed borrow site to GAF.

# 3.17 Transportation

## 3.17.1 Affected Environment

GAF lies southeast of the city of Gallatin, Tennessee on a bend of the Cumberland River. The transportation network surrounding GAF contains local roads, rail lines, and navigable waterways. U.S. Highway 109, a major thoroughfare, is the primary north-south route in the vicinity. State Highway 25/Hartsville Pike runs east-west on the east side of Gallatin and provides a direct connection to Steam Plant Road.

U.S. Highway 109 provides truck and automobile access to GAF from the west via Odoms Bend Road to Steam Plant Road. Steam Plant Road provides direct access to GAF from the east. Odoms Bend Road and Steam Plant Road are both two-lane asphalt roads. Coles Ferry Road, also a two-lane asphalt road, intersects Odoms Bend Road and extends to the north, just west of and parallel to Steam Plant Road toward the City of Gallatin where it veers to the west. The surrounding roadway network is shown on Figure 1-1. Traffic generated by existing operations at GAF is composed of a mix of cars and light duty trucks, as well as medium duty to heavy duty trucks. The 2016 Annual Average Daily Traffic (AADT) counts and existing levels of service (LOS) on key roadways in the immediate vicinity of GAF are indicated in Table 3-9. LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS is described accordingly:

- LOS A: describes free flow traffic conditions;
- LOS B: free flow conditions although presence of other vehicles begins to be noticeable;
- LOS C: increases in traffic density become noticeable but remain tolerable to the motorist;
- LOS D: borders on unstable traffic flow; the ability to maneuver becomes restricted; delays are experienced;
- LOS E: traffic operations are at capacity; travel speeds are reduced; ability to maneuver is not possible; travel delays are expected; and
- LOS F: designates traffic flow breakdown where the traffic demand exceeds the capacity of the roadway; traffic can be at a standstill.

## Table 3-9. Average Daily Traffic Volume (2016) on Roadways in Proximity to GAF

Poadway	Exist. Average Daily Vehicle Use	Number of	Existing Level of Service
U.S. Highway 109, South of Cumberland River Bridge	17,811	2	C
Odoms Bend Road	2,561	2	А
Steam Plant Road, North of GAF	1,983	2	А
Steam Plant Road in City of Gallatin	1,733	2	А
Cole's Ferry Road	1,983 <sup>1</sup>	2	А
State Highway 25 (Hartsville Pike), East of Steam Plant Road	10,394	4	A

<sup>1</sup> No AADT volume available. As a conservative assumption the traffic volume on Cole's Ferry Road is assumed to be similar to Steam Plant Road.

Source: Tennessee Department of Transportation 2016

## 3.17.2 Environmental Consequences

#### 3.17.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, TVA would not develop a borrow site or access road on TVA property. Borrow material is needed to continue with current operations and to support future operations, so TVA would obtain borrow from one or more existing offsite commercial sources within 30 miles of GAF. The use of over-the-road haul trucks would be required to transport the borrow material.

Impacts to transportation would result from increased traffic volumes on public roadways between the offsite commercial borrow site(s) and GAF. Although the exact location of these borrow sites are not known, transport of material to GAF would utilize existing arterial or interstate roadways as much as possible. However, access to GAF from the west via U.S. Highway 109 is from Odoms Bend Rd to Steam Plant Road. Steam Plant Road would be the primary access to the plant from the east. It is assumed the number of truckloads per day to haul borrow for this alternative would be the same as Alternative B, which is 34 truckloads per day, or 68 truck trips. Assuming a distance of 30 miles for the offsite borrow location, this would result in the transport of up to 2,040 vehicle miles per day under this alternative. This additional truck traffic would not have an impact on capacity of the surrounding arterial roadways. The transport of borrow would increase the existing traffic volume by up to 2.7 percent on Odoms Bend Road and 3.4 percent on Steam Plant Road. depending on where the borrow is obtained. Although this increase would not affect the LOS on these roads, the additional truck traffic may cause localized roadway degradation, and potential effects to localized traffic flow patterns because of increased truck traffic. However, this impact would be minor given the relatively small number of truck trips anticipated as compared to traffic levels on the existing roadway network and the intermittent nature of borrow transport.

The proposed transport of borrow material over public roadways under this alternative would result in a notable increase in the number of vehicle miles traveled on surrounding roadways as compared to Alternative B, which is a factor in injury and fatal traffic crash rates. The number of truck-related crashes associated with the transport of borrow to GAF could increase and consequently could compromise driver safety.

#### 3.17.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

TVA would develop a borrow site on TVA property approximately 1.5 miles northwest of GAF. The daily workforce during construction of the access road and borrow site development is expected to be 25 workers. Workforce traffic would predominantly consist of a mix of passenger cars and light duty trucks (such as delivery trucks). Assuming one person per commuting vehicle, there would be a daily morning inbound traffic volume of 25 vehicles and a daily outbound traffic volume of 25 vehicles for a total of 50 vehicles per day. Workforce traffic is assumed to be distributed during peak morning period (to the site) and during a peak evening period (away from the site). This traffic volume is expected to disperse into the surrounding road network and have negligible effects on these roads. In addition to typical workforce traffic, heavy equipment would be used to support initial development of the borrow site. Although woody vegetation would be chipped on-site and used as mulch to prevent erosion, any unsuitable material would be stockpiled or removed from the site to an approved solid waste facility for disposal. Transport of unsuitable material is not expected to impact surrounding roadways as the volume of material transported offsite would be minimized as the majority of woody material is expected to be chipped onsite.

A gravel access road would also be constructed to connect the proposed borrow site to Steam Plant Road. This new access road would include an at-grade crossing at Cole's Ferry Road and an existing rail line before it intersects with Steam Plant Road. The two existing roads are approximately 600 feet apart at the point where the access road enters the borrow site. The existing railroad is not active at GAF. Excavated soil would be transported from the borrow site to GAF via Steam Plant Road. Although the haul trucks would not utilize Cole's Ferry Road as part of the haul route, they would cross over the road and eventually enter open traffic lanes on Steam Plant Road which may lead to unsafe conditions during periods when borrow is transported to GAF. Therefore, localized effects on traffic flow and safety may be evident at Cole's Ferry Road. As required by the Tennessee Department of Transportation, TVA would obtain an place proper safety and warning signs to inform drivers to be alert for construction traffic entering and exiting the access road which would minimize the potential for accidents. In addition, traffic entering and exiting the borrow site would yield to through traffic on Cole's Ferry Road. These measures would reduce the localized and intermittent transportation effects on Cole's Ferry Road and the impact would be minor.

It is anticipated that up to 500 yd<sup>3</sup> of borrow per day would be transported from the borrow site to GAF via over-the-road haul trucks when borrow is needed to support operations at GAF. Each truck has 15 yd<sup>3</sup> of borrow capacity. Therefore, approximately 34 truckloads per day would be used to transport borrow to GAF, which would result in a truck trip count of 68 trucks per day on Steam Plant Road. Assuming a distance of 1.5 mile for the near offsite borrow location, this would result in the transport of up to 102 vehicle miles per day under this alternative. While these additional truck trips would increase traffic volume by 3.4 percent, the LOS would remain at a level A. The added trips are expected to have minor impacts to transportation on Steam Plant Road due to the intermittent nature of the hauling. The hauling of borrow material would not have an effect on any of the other public roads listed in Table 3-9.

# 3.18 Noise

## 3.18.1 Affected Environment

Noise is unwanted or unwelcome sound usually caused by human activity and added to the natural acoustic setting of a locale. Noise is further defined as sound that disrupts normal activities and diminishes the quality of the environment. Community response to noise is dependent on the intensity of the sound source, its duration, the proximity of noise-sensitive land uses, and the time of day the noise occurs. For instance, higher sensitivities to noise would be expected during the quieter overnight periods at noise sensitive receptors such as residences. Other receptors might include developed sites where frequent human use occurs such as churches and schools.

Sound is measured in units of decibels (dB) on a logarithmic scale. Because not all noise frequencies are perceptible to the human ear, A-scale weighting decibels (dBA), which filter out sound in frequencies above and below human hearing, are typically used in noise assessments. A noise level change of 3 dBA or less is barely perceptible to average human hearing. However, a 5 dBA change in noise level is clearly noticeable. The noise level associated with a 10 dBA change is perceived as being twice as loud; whereas the noise level associated with a 20 dBA change is considered to be four times as loud and would therefore represent a "dramatic change" in loudness.

The day-night sound level (Ldn), is the 24-hour equivalent sound level, which incorporates a 10-dBA correction penalty for the hours between 10 p.m. and 7 a.m., to account for the increased sensitivity of people to sounds that occur at night. Ambient noise in the vicinity of the proposed borrow site is anticipated to range between a Ldn of 35 and 50 dB, which are typical background day/night noise levels for rural areas, whereas higher-density residential and urban areas background noise levels range from 43 dB to 72 dB (EPA 1974). Background noise levels greater than 65 dBA can interfere with normal conversation, watching television, using a telephone, listening to the radio, and sleeping.

The EPA 1974 guidelines recommend that Ldn not exceed 55 dBA for outdoor residential areas. The U.S. Department of Housing and Urban Development (HUD) considers an Ldn of 65 dBA or less to be compatible with residential areas (HUD 1985). For traffic-related noise, the Federal Highway Administration (FHWA) has set a threshold of 67 dBA as the sound level at which noise abatement should be considered. The Tennessee Department of Transportation has adopted this same threshold for projects in Tennessee.

#### 3.18.1.1 Sources of Noise

The proposed borrow site is located in a rural residential area located southeast of Gallatin, Tennessee. Noise generating sources in the vicinity of the project site include traffic noise along Steam Plant Road, and noise from air traffic associated with the Gallatin Municipal Airport located approximately two miles northeast of the proposed borrow site.

Transportation noise related to activities evaluated in this EA primarily include noise from truck traffic associated with hauling borrow material. Three primary factors influence highway noise generation: traffic volume, traffic speed, and vehicle type. Generally, heavier traffic volumes, higher speeds, and greater numbers of trucks increase the sound level of highway traffic noise. Highway traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (FHWA 2011). Due to the nature of the decibel scale and the attenuating effects of noise with distance, a doubling of traffic volume would result in approximately a 3 dBA increase in noise levels, which would not normally be a perceptible noise increase (FHWA 2011).

The level of construction noise is dependent upon the nature and duration of the project. Construction activities for most large-scale projects would be expected to result in increased noise levels due to operation of construction equipment and the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways. Noise levels associated with construction activities would increase ambient noise levels adjacent to the construction site and along roadways used by construction-related vehicles. Construction noise is generally temporary and intermittent in nature as it generally occurs on weekdays during daylight hours which minimizes the impact to receptors.

## 3.18.1.2 Noise Receptors

The borrow site lies on TVA owned property, approximately 1.5 mile north-northwest of GAF and is surrounded by a mix of rural residential properties and open pasture with wooded areas interspersed throughout. Nearby noise sensitive receptors include residents living near the borrow site and along the haul route that would be used to transport borrow material to the plant site. The closest sensitive receptor to the proposed borrow site and haul route is a home located approximately 113 feet south of the borrow site on Cole's Ferry Road. Additional homes are located near the northern site boundary, and eastern boundary of the borrow site along Cole's Ferry Road. The closest receptors in these areas are located 375 feet and 135 feet from the boundary of the limits of disturbance of the proposed borrow site respectively.

## 3.18.2 Environmental Consequences

## 3.18.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, TVA would not develop a borrow site or access road on TVA property; therefore, there would be no change in the existing noise environment under

this alternative. However, to support ongoing plant operations, TVA would still require borrow, which it would obtain, as needed, from one or more existing offsite commercial sources.

Traffic associated with the transport of borrow material to and from an offsite location would result in an increase in intermittent noise at residences or other sensitive receptors located along any local roads that may be utilized during the hauling period due to the additional truck traffic. It is expected that suitable borrow material would be available within a 30-mile radius of GAF. Although the exact location of these borrow sites are not known, transport of material to GAF would utilize existing arterial or interstate roadways as possible as much as possible. Assuming a distance of 30 miles for the offsite borrow location, this would result in the transport of up to 2,040 vehicle miles per day under this alternative. Access to GAF from the west via U.S. Highway 109 is from Odoms Bend Rd to Steam Plant Road. Steam Plant Road would be the primary access to the plant from the east. Seven residences are located within 200 feet of the portion of Odoms Bend Road that would be used to access GAF. Noise impacts from the transport of borrow along these roadways is expected to be greater than Alternative B but sill minor as the number of trucks used to transport borrow material would not have a noticeable increase on traffic volume and consequently traffic noise near those roadways.

**3.18.2.2** Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property Noise impacts under this alternative would be associated with construction and operation of the borrow site, construction-related traffic (construction workforce) to and from the project site, and the transport of borrow material to GAF.

Typical construction equipment used during development and operation of the borrow site would consist of front-end loaders, dozers, excavators, graders and dump/haul trucks (see Table 2-1). Typical noise levels from this equipment is expected to be 85 dBA or less at a distance of 50 feet from the construction equipment (FHWA 2016). Multiple residences are located in the area surrounding the borrow site, including a small neighborhood along the northern limits of the area. Based on straight line noise attenuation, it is estimated that noise levels from these sources would attenuate to 77.9 dBA at the residence south of the borrow site and 76.4 at the nearest residence east of the borrow site, along Cole's Ferry Road, and 67.5 dBA at the receptor north of the limits of disturbance of the borrow site exceeding the EPA Ldn guideline of 55 dBA and the HUD Ldn guideline of 65 dBA. However, the actual noise would probably be lower in the field at all three of these receptors as tree stands and topography would cause further noise attenuation. For example, reviews included by Dobson and Ryan (2000) indicated that in some instances noise can be reduced by 6 dB over a distance of approximately 95 feet where planting is particularly dense. It was reported that a dense belt of trees and shrubs between approximately 47 to 94 feet wide could reduce sound levels by as much as 6-10 dB. Noise from development and operation of the borrow site would only occur during specific construction periods (when borrow is needed at GAF) during normal working hours which would minimize noise impacts. Given the intermittent nature of construction noise, the impact of noise generated from construction activities is expected to be minor.

Assuming a distance of 1.5 miles for the near offsite borrow location, this would result in the transport of up to 102 vehicle miles per day under this alternative. Construction-related traffic on local roads near GAF is expected to be negligible and, therefore, these additional vehicles would result in negligible noise impacts.
There is a potential for indirect noise impacts associated with an increase in traffic related to the transport of borrow material to GAF. Noise impacts from the transport of borrow along this road is expected to be negligible as the number of trucks used to transport borrow material would not have a noticeable increase on traffic volume and consequently traffic noise near those roadways. Additionally, there are no residences within 50 feet of Steam Plant Road. Given this, the hauling of borrow to GAF is not expected to impact existing noise levels.

# 3.19 Socioeconomics and Environmental Justice

# 3.19.1 Affected Environment

Given the nature of the proposed action, the spatial extent for the socioeconomic and environmental justice (EJ) analysis was defined as Census Block Group 1 within Census Tract 209.01, the census block group which encompasses the proposed borrow site project area and the associated haul route to GAF and Census Block Group 1, Census Tract 209.02, the census block immediately adjacent to the northwestern boundary of the proposed borrow site. Included as secondary geographic areas of reference are Sumner County and the State of Tennessee. Comparisons at multiple spatial scales provides a more detailed picture of populations that may be affected by the proposed actions including any EJ populations (e.g., minority and low income). Demographic and economic characteristics of resident populations were assessed using the 2012-2016 American Community Survey (ACS) 5-year estimates provided by the U.S. Census Bureau (USCB 2018a).

# 3.19.1.1 Demographics

Demographic characteristics of the study area (population and race) are summarized in Table 3-10. The communities surrounding the borrow site project are primarily rural, with a total of 3,518 people living in Block Group 1 of Census Tract 209.01 and Block Group 1 of Census Tract 209.02. The nearest population center is the City of Gallatin, Tennessee, where 33,426 people or 19.3 percent of the population of Sumner County, reside.

The population surrounding the proposed borrow site is predominantly comprised of white people, with 89.2 percent of the population of Block Group 1, Census Tract 209.01 and 81.5 percent of Block Group 1, Census Tract 209.02 identifying as white. This is comparable to that of Sumner County (88.7 percent white) and slightly higher than that of Tennessee (77.8 percent white). Black or African American is the largest minority near the borrow site, comprising 8.6 percent of both Block Group 1, Census Tract 209.01 and Block Group 1, Census Tract 209.02.

# 3.19.1.2 Economic Conditions

Economic characteristics are shown in Table 3-10. The per capita income for Block Group 1, Census Tract 209.01 of \$30,298 is comparable to that of Sumner County (\$29,313) and higher than Tennessee (\$26,019), while the per capita income for Block Group 1 of Census Tract 209.02 (\$20,064) is lower than the reference geographies. Additionally, persons living below the poverty line in Block Group 1, Census Tract 209.01 (9.6 percent) and Block Group 1, Census Tract 209.02 (11.8 percent) are comparable to that of Sumner County (9.7 percent) and below the state rate of 17.2 percent.

The civilian labor force in the communities near the project area is 857 people and 1,030 people for Block Group 1, Census Tract 209.01 and Block Group 1 of Census Tract 209.02, respectively. Block Group 1, Census Tract 209.has an unemployment rate of 4.1 percent,

which is lower than both Sumner County (5.3 percent) and Tennessee (7.5 percent). The unemployment rate for Block Group 1 of Census Tract 209.02 is 11.5 percent, which is more than double that of Sumner County and 4 percent higher than Tennessee.

	Block Group 1, Census Tract 209.01	Block Group 1, Census Tract 209.02	Sumner County	State of Tennessee
Population <sup>1</sup>				
Population, 2016 estimate	1,575	1,943	172,786	6,548,009
Racial Characteristics <sup>1</sup>				
White alone, 2015 (a)	89.2%	81.5%	88.7%	77.8%
Black or African American, 2015 (a) American Indian and Alaska	8.6%	8.6%	6.8%	16.8%
Native, 2015 (a)	0.0%	0.0%	0.3%	0.3%
Asian, 2015 (a)	0.0%	3.9%	1.2%	1.6%
Native Hawaiian and Other				
Pacific Islander, 2015 (a)	0.0%	0.0%	0.1%	0.1%
Some Other Race, 2015 (a)	2.2%	4.1%	1.1%	1.4%
Two or More Races, 2015	0.0%	1.9%	1.8%	2.0%
Hispanic or Latino, 2015 (b)	6.8%	4.1%	4.3%	5.0%
Percent Minority	17.6%	27.2%	15.6%	17.2%
Income and Labor Force <sup>1</sup>				
Per Capita Income, 2011- 2015 Persons below poverty level	\$30,298	\$20,064	\$29,313	\$26,019
2011-2015 Civilian Labor Force >16-	9.6%	11.8%	9.7%	17.2%
years old	857	1,030	89,066	3,175,503
Percent Employed	95.9%	88.5%	94.7%	92.5%
Percent Unemployed	4.1%	11.5%	5.3%	7.5%

Table 3-10.	Socioeconomic	Characteristics of	of Proposed I	Borrow Site Stud	ly Area
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(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

Source: <sup>1</sup>USCB 2017a

#### 3.19.1.3 Community Facilities and Services

Community facilities and services are public or publicly-funded facilities such as police protection, fire protection, schools, hospitals and other healthcare facilities, libraries, day-care centers, churches, and community centers. Direct impacts to community facilities occur when a community facility is displaced or access to the facility is altered. Indirect impacts can also occur when a proposed project results in a population increase that would generate greater demands for services and affect the delivery of such services. The study areas for community impacts are the same as for the socioeconomic analyses described above.

Community services available to the communities within the study area include fire and emergency services, law enforcement, churches, cemeteries, and schools (see Figure 3-7). Specifically, there is one airport, four cemeteries, 14 churches, two hospitals, and 21 schools within a 5-mile radius of the proposed borrow site project area. Most of these facilities are concentrated in and around Gallatin, Tennessee.

#### 3.19.1.4 Environmental Justice

On February 11, 1994, President Clinton signed EO 12898 Federal Actions to Address EJ in Minority Populations and Low-Income Populations. EO 12898 mandates some federalexecutive agencies to consider EJ as part of the NEPA. EJ has been defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income (EPA 2017a) and ensures that minority and low-income populations do not bear disproportionately high and adverse human health or environmental effects from federal programs, policies, and activities. Although TVA is not one of the agencies subject to this order, TVA routinely considers EJ impacts as part of the project decision-making process.

Guidance for addressing EJ is provided by the CEQ's Environmental Justice Guidance under the National Environmental Policy Act (CEQ 1997). The CEQ defines minority as any race and ethnicity as classified by the USCB as: Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; some other race (not mentioned above); two or more races; or a race whose ethnicity is Hispanic or Latino (CEQ 1997). Low income populations are based on annual-statistical poverty thresholds also defined by the USCB.

Identification of minority populations requires analysis of individual race and ethnicity classifications as well as comparisons of all minority populations in the region. Minority populations exist if either of the following conditions is met:

- The minority population of the impacted area exceeds 50 percent of the total population.
- The ratio of minority population is meaningfully greater (i.e., greater than or equal to 20 percent) than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997).

Low-income populations are those with incomes that are less than the poverty level, which varies by the size of family and number of related children under 18 years (CEQ 1997). The 2016 USCB Poverty Thresholds states the poverty threshold as an annual household income of \$24,563 for a family of four (USCB 2018b). For an individual, an annual income of \$12,228 is the poverty threshold. A low-income population exists if either of the following two conditions is met:

- The low-income population exceeds 50 percent of the total number of households.
- The ratio of low income population significantly exceeds (i.e., greater than or equal to 20 percent) the appropriate geographic area of analysis.

Minority populations make up 17.6 percent of Block Group 1, Census Tract 209.01 and 22.5 percent of Block Group 1, Census Tract 209.02. Comparatively, minorities comprise 15.6 percent of the population of Sumner County and 27.2 percent of Tennessee. The selected block groups do not exceed EJ thresholds for any minority population when compared to the reference geographies.

The poverty rate within Block Group 1, Census Tract 209.01 is 9.6 percent of the population and the poverty rate within Block Group 1, Census Tract 209.02 is 11.8 percent. These are comparable to that of Sumner County (9.7 percent) and lower than the poverty rate for Tennessee (17.2 percent). The selected block groups do not exceed EJ thresholds for poverty when compared to the reference geographies.

## 3.19.2 Environmental Consequences

#### 3.19.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, TVA would not proceed with development of an onsite borrow site. There would be no change in local demographics, economic conditions, or community services under the No Action Alternative; therefore, no short-term positive or negative economic impacts associated with construction activities would occur.

However, to support ongoing plant operations, TVA would still require borrow material, which would be obtained as needed, from one or more existing offsite commercial sources. Although the exact location of the borrow sites is not known, sensitive communities subject to environmental justice consideration along the haul route may be impacted due to an increase in traffic noise and exposure to fugitive dust and exhaust emissions. The transport of material to GAF would utilize existing arterial or interstate roadways as much as possible. However, local roads would be used to access GAF. Access to the west via U.S. Highway 109 is from Odoms Bend Rd to Steam Plant Road. Steam Plant Road would be the primary access to the plant from the east. Communities located along arterial routes are generally set back at a distance from the roadway and should not be impacted. No populations subject to EJ consideration were identified along the local roads that provide access to GAF. Therefore, no disproportionate impacts to environmental justice populations are expected to occur as a result of implementation of Alternative A.

#### 3.19.2.2 Alternative B – Develop and Operate a Borrow Site on TVA-Owned Property

Under Alternative B, demographic characteristics of the project area are not expected to change significantly in response to an increase in temporary construction workforce. The construction workforce is estimated to peak at 55 workers for the project. These workers could be drawn from the labor force that currently resides in the study area. No additional permanent workers would be employed as a result of implementation of this alternative. Overall, no long-term impacts to local demographics are expected due to the small and temporary increased in workers related to the development of a borrow site.

Potential economic impacts associated with the proposed projects relate to direct and indirect effects of construction as well as the long-term operation of the facilities. Development of the borrow site would cause a temporary increase in employment and associated payrolls, the purchases of materials and supplies, and procurement of additional services. New construction workers and truck drivers are expected to be residents of the surrounding area, which would help temporarily reduce unemployment in the study area. Revenue generated from sales tax from any additional purchases would also benefit the local economy. Capital costs associated with the proposed action would have direct economic benefits to the local area and surrounding community. Some beneficial secondary impacts to the economy are also expected in conjunction with the multiplier effects of construction. For example, local food and service industries would benefit from the demands brought by the increased construction workforce. However, given the size of the anticipated workforce (peak of up to 55 workers) and the temporary nature of the work, overall primary and secondary economic impacts are considered minor.

Community facilities would not be directly affected by the development of a borrow site. No community facilities are located along the proposed borrow haul route and no significant worker relocations to the area are anticipated; therefore, community services including fire, police, medical, and schools can likely accommodate the local population and would not be affected by the action.

No populations subject to EJ consideration were identified within the vicinity of the borrow site or along the access route to CUF. Therefore, no disproportionate impacts to environmental justice populations are expected to occur as a result of implementation of Alternative B.

# 3.20 Solid and Hazardous Waste

# 3.20.1 Affected Environment

In Tennessee, requirements for management of solid wastes are focused on solid waste processing and disposal under Rule 0400-11-.01 in Tennessee's Solid Waste Management Act of 1991. Solid wastes are defined in the rule as garbage, trash, refuse, abandoned material, spent material, byproducts, scrap, ash, sludge and all discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial and agricultural operations, and from community activities. Subtitle D Resource Conservation and Recovery Act and its implementing regulations establish minimum federal technical standards and guidelines for nonhazardous solid waste management.

In general, hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or the environment when released into the environment. Hazardous materials are regulated under a variety of federal laws including Occupational Safety and Health Administration (OSHA) standards, Emergency Planning and Community Right to Know Act, Resource Conservation and Recovery Act and its implementing regulations establish minimum federal technical, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and the Toxic Substances Control Act.

GAF is considered a small quantity generator of hazardous waste by TDEC. The primary hazardous wastes currently generated at the plant include small quantities of waste paint, waste paint solvents, paper insulated lead cable, mercury contaminated debris, debris from sandblasting and scraping, paint chips, solvent rags due to cleaning electric generating equipment, Coulomat (used to remove moisture from oil) and liquid-filled fuses.

# 3.20.2 Environmental Consequences

#### 3.20.2.1 Alternative A – No Action

Under the No Action Alternative, the onsite borrow site would not be developed. Borrow material would be obtained, as needed, from offsite commercial sources and no solid or hazardous waste would be generated as a result of implementation of this alternative. Therefore, there would be no impacts to solid waste and hazardous waste generation under this alternative.

#### 3.20.2.2 Alternative B – Develop and Operate a Borrow Site on TVA Owned Property

The proposed borrow site is currently undeveloped with some forested land. Portions of the site have been farmed. Consequently, no solid or hazardous material or waste exists in the area. During borrow site development, some debris and waste materials would be generated and removed from the proposed borrow site. It is expected that this material

would primarily be vegetative waste associated with preparation of the area for soil excavation. Woody vegetation would be chipped on-site and used as mulch to prevent erosion. Any unsuitable material would be stockpiled or removed from the site. All materials removed from the site would be properly managed and disposed of at approved solid waste facilities or recycled in compliance with applicable pertinent federal, state and local requirements. TVA would coordinate material removal using TVA standard BMPs (TVA 2017a).

Hazardous waste generated during development and operation of the borrow site may include limited quantities of fuels, lubricating oils, and other hazardous materials. Appropriate spill prevention, containment, and disposal requirements for hazardous materials would be implemented to protect construction and plant workers, the public, and the environment. A permitted third-party waste disposal facility would be used for ultimate disposal of the wastes.

Solid and hazardous wastes generated at TVA facilities are managed in accordance with established procedures and applicable regulations, and wastes generated by equipment maintenance would be managed under existing programs. The status of GAF as a small quantity generator of hazardous waste would not change under this alternative. Therefore, no impacts to solid waste and hazardous waste generation are anticipated.

# 3.21 Public Health and Safety

### 3.21.1 Affected Environment

Workplace health and safety regulations are designed to eliminate personal injuries and illnesses from occurring in the workplace. The OSHA is the main statute protecting the health and safety of workers in the workplaces TVA has a robust safety conscious culture that is focused on awareness and understanding of workplace hazards, prevention, intervention, and active integration of BMPs to avoid and minimize hazards.

General guidelines for work place safety that are communicated to work crews include the following:

- *Pre-Job Brief* allows the worker to think through a job and use that knowledge to make the job as safe as possible.
- *Two-Minute Rule* (situational awareness) take time before starting a job to familiarize yourself with the work environment and to identify conditions that were not identified during the pre-job brief.
- *Stop When Unsure* when confronted with a situation that creates a question and what to do is uncertain, stop and get help.
- Self-Check use of "STAR" acronym to promote self-check awareness: Stop and focus, Think what will happen with right or wrong action, Act correctly, Review that the results are as expected
- *Procedure Use and Adherence* allows for proper application of procedures and work packages based on expected activities
- *Flagging and Operational Barriers* key to ensure control of the work zones and avoidance of exposure to work hazards by public
- *Three-Way Communication* essential for all job tasks to ensure they are completed safely and productively.

TVA's Safety Standard Programs and Processes would be strictly adhered to during the proposed actions. The safety programs and processes are designed to identify actions required for the control of hazards in all activities, operations and programs. It also establishes responsibilities for implementing OSHA and state requirements.

It is TVA's policy that contractors have a site-specific health and safety plan in place prior to conducting construction activities at TVA properties. The contractor site-specific health and safety plans address the hazards and controls as well as contractor coordination for various construction tasks. A health and safety plan would also be required for workers responsible for operations after construction is complete.

The potential offsite consequences and emergency response plan are discussed with local emergency management agencies. These programs are audited by TVA no less than once every three years and by EPA periodically.

Health hazards are also associated with emissions and discharges from the facility as well as accidental spills/releases at the plant and/or along the pipelines. Mitigative measures are used to ensure protection of human health which includes the workplace, public and the environment.

Additionally, wastes generated by operation of GAF can pose a health hazard. Wastes including solid wastes, hazardous waste, liquid wastes, discharges and air emissions are managed in accordance with applicable federal, state and local laws and regulations and all applicable permit requirements. Furthermore, waste reduction practices are employed including recycling and waste minimization. TVA is committed to complying with all applicable regulations, permitting and monitoring requirements.

# 3.21.2 Environmental Consequences

#### 3.21.2.1 Alternative A – No Action Alternative

The operations and maintenance activities at GAF would continue within the safetyconscious culture and activities currently performed in accordance with applicable standards or specific TVA guidance. TVA would continue to address and manage reduction or elimination of occupational hazards through implementation of safety practices, training and control measures. However, under this alternative, TVA would obtain borrow from offsite sources and as would potentially increase the risk of injuries and fatalities associated with the transport of borrow on public roadways. Through its safety programs, TVA would foster a culture of safety-minded employees, including activities which are conducted offsite. Therefore, this impact would be minor, yet greater than Alternative B given the increased transport distance and associated additional man-hours needed.

#### 3.21.2.2 Alternative B – Develop and Operate a Borrow Site on TVA Owned Property

Construction and operation of the borrow site would be performed consistent with standards as established by OSHA and state requirements as well as BMPs and TVA safety plans and procedures. Construction activities include excavation and transport of borrow material. These activities would require the use of earthmoving equipment as well as personal vehicles for workers and trucks for hauling materials.

During construction and operation of the borrow site and access road, customary industrial safety standards as well as the establishment of applicable BMPs and job site safety plans would describe how job safety would be maintained. These BMPs and site safety plans address the implementation of procedures to ensure that equipment guards, housekeeping,

and personal protective equipment are in place; the establishment of programs and procedures for right-to-know, hearing conservation, equipment operations, excavations, grading, and other activities; the performance of employee safety orientations and regular safety inspections; and the development of a plan of action for the correction of any identified hazardous. Construction debris and wastes would be managed in accordance with federal, state, and local requirements.

Activities occurring offsite include construction traffic and delivery of materials and supplies using local and regional roadways. This could create a safety issue as borrow is transported to GAF however this impact is minimized given the relatively short transport distance between the borrow site and GAF. Through its safety programs, TVA would foster a culture of safety-minded employees, including activities which are conducted offsite.

Potential safety issues under Alternative B are therefore related to transportation of borrow material for a short distance on the existing roadway network. From this limited transport of borrow on public roads, there would be a minor potential impact to public health and safety. However, construction and borrow activities would adhere to TVA guidance and be performed consistent with standards established by OSHA so as to maintain public health and safety during construction and borrow transportation.

# 3.22 Cumulative Impacts

This section supplements preceding analyses that include the potential for cumulative adverse impacts to the region's environment that could result from the implementation of the proposed development of a borrow site and access road. A cumulative impact analysis must consider the potential impact on the environment that may result from the incremental impact of a project when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). Baseline conditions reflect the impacts of past and present actions. The impact analyses summarized in preceding sections are based on baseline conditions and either explicitly or implicitly already have considered the impacts of past and present actions with those of the proposed action.

TVA evaluated a full range of environmental resource issues for inclusion in the cumulative effects analysis. The proposed actions and their connected actions identified under Alternative B would occur mostly on land that is undeveloped and covered with forested and herbaceous vegetation. The surrounding landscape includes rural residential and undeveloped forested land to the north, south, east and west. However, the City of Gallatin is located approximately 1.5 miles to the north of the proposed borrow site and GAF is located approximately 1.5 miles south of the proposed borrow site. Consequently, the existing quality of environmental resources within the vicinity of the proposed with the potential to be directly or indirectly impacted by project activities has been affected by commercial and industrial operations.

# 3.22.1 Geographic Area of Analysis

The appropriate geographic area over which past, present, and future actions could reasonably contribute to cumulative effects is variable and dependent on the resource evaluated. Based upon the defined list of resources potentially affected by cumulative effects, the land and water resources within a 5-mile radius of the proposed actions was considered appropriate for consideration in this analysis. This geographic area also encompasses the proposed borrow site and haul route to GAF.

## 3.22.2 Identification of "Other Actions"

Past, present, and reasonably foreseeable future actions that are appropriate for consideration in this cumulative analysis are listed in Table 3-11. These actions were identified within the geographic area of analysis as having the potential to, in the aggregate, result in larger and potentially significant adverse impacts to the resources of concern.

		Timing and Reasonable
Actions Description	Description	Foreseeability
Construction and operation of the North Rail Loop Landfill	TVA constructed a landfill onsite at GAF to provide storage for dry CRR	Past, Present, Reasonably Foreseeable Future
Operation of the Cumberland River Aquatic Center (CRAC)	The CRAC is a hatchery facility originally constructed by TVA at GAF and managed by TWRA	Past, Present, Reasonably Foreseeable Future
TDOT State Route (SR) 109 widening project	Widening of SR 109 in Sumner and Wilson Counties	Past, Present, Reasonably Foreseeable Future
Construction of a bottom ash process dewatering facility	Construction of a mechanical bottom ash dewatering facility at GAF to create dry CCR for storage	Present, Reasonably Foreseeable Future
CCR Management Projects	TVA plans to close the following surface impoundments at GAF: Ash Pond A, Ash Pond E and Middle Pond A) and construct a landfill for additional dry CCR storage	Reasonably Foreseeable Future
Installation of emission control equipment and associated facilities at GAF	Equipment was installed at GAF to reduce emissions	Past

# Table 3-11.Summary of Other Reasonably Foreseeable Future Actions in the<br/>Vicinity of the Proposed Borrow Site

Actions that have a timing that is "past" or "present" inherently have environmental impacts that are integrated into the base condition for each of the resources analyzed in this chapter. However, these actions are included in this discussion to provide for a more complete description of their characteristics. Actions that are not reasonably foreseeable are those that are based on mere speculation or conjecture, or those that have only been discussed on a conceptual basis.

#### 3.22.2.1 Construction of the North Rail Loop Landfill

The North Rail Loop Landfill was constructed onsite at GAF to provide storage for dry CCR produced by a dry Flue Gas Desulfurization scrubber system. Construction of Cell 1 was completed in March 2016, and construction of the remaining two cells will be completed over the next seven to 15 years. The landfill is estimated to cover 52 acres and provide capacity to store 6.7 million cubic yards of CCR.

#### 3.22.2.2 Operation of the CRAC

The CRAC is an aquatic species hatchery facility that TVA constructed on the GAF reservation. It is currently managed by TWRA for the study and preservation of threatened and endangered freshwater aquatic species. Operation of the CRAC would not contribute to cumulative impacts.

#### 3.22.2.3 TDOT SR 109 Widening Project

The TDOT SR 109 widening project is currently underway in Sumner and Wilson Counties. Most of the project activities in the vicinity are complete, including the Gallatin Bypass, the Gallatin Bypass to Portland, the Cumberland Bridge replacement, and the widening of SR 109 from north of I-40 to south of SR 24 (US 70). The widening of SR 109 from north of Cumberland River Bridge to the Gallatin Bypass and from north of SR 24 (US 70) to south of the Cumberland River Bridge is underway and expected to be complete by August 2019 and November 2020, respectively (TDOT 2018).

#### 3.22.2.4 Construction of a Bottom Ash Process Dewatering Facility

TVA is planning to construct and operate a bottom ash dewatering facility at GAF. The purpose of the new facility is to help TVA meet its commitment to convert CCR storage from wet to dry. The facility would be constructed within GAF property on the former site of the chemical pond, in an area that has previously been disturbed. Construction of the dewatering facility is expected to take place over an 18- to 24-month period.

#### 3.22.2.5 CCR Management Projects

As part of TVA's goal to eliminate wet ash storage at its coal plants, TVA is considering construction and operation of several projects at GAF to manage CCRs. Although a decision regarding specific actions associated with these activities has not been finalized, the closure of existing surface impoundments and long-term management and storage of future CCR generated at GAF, including construction of a landfill on GAF property, are reasonably foreseeable activities. As noted in Section 1.2, the environmental impacts of activities associated with these actions will be assessed in future environmental reviews, which would include a detailed cumulative effects assessment as part of the evaluation of alternatives.

#### 3.22.2.6 Installation of Emission Control Equipment and Associated Facilities at GAF

TVA constructed a dry flue gas desulfurization (scrubber) in 2016, selective catalytic reduction, pulse jet fabric filter, and activated carbon injection systems to meet regulatory requirements and agency and advocacy group agreements. The installation of these systems has resulted in a decrease in air pollutants emitted at GAF.

#### 3.22.3 Analysis of Cumulative Effects

To address cumulative impacts, the existing affected environment surrounding the project area was considered in conjunction with the environmental impacts presented in Chapter 3. These combined impacts are defined by the CEQ as "cumulative" in 40 CFR 1508.7 and may include individually minor, but collectively significant actions taking place over a period of time.

This analysis is limited only to those resource issues potentially adversely affected by project activities or connected actions. Accordingly, climate change, geology, soils, groundwater, wildlife, threatened and endangered species, floodplains, wetlands, cultural and historic resources, land use, managed and natural areas, parks and recreation, and environmental justice are not included in this analysis as these resources are either not adversely affected, or the effects are considered to be beneficial.

Primary adverse cumulative effects of the proposed actions as described in the preceding sections of Chapter 3 are related to the potential additive and overlapping effects on air quality, soils, surface water, aquatic ecology, vegetation, transportation, and noise. It is likely that the construction phase of the other reasonably foreseeable future actions

identified within the region may overlap with the term operations associated with the proposed action. The potential for cumulative effects to the identified environmental resources of concern are analyzed below for Alternative B.

#### 3.22.3.1 Air Quality

Among the other identified actions within the geographic area, on-going construction and operation of the North Rail Loop Landfill, the SR 109 widening project, and construction of the bottom ash process dewatering facility may result in minor effects to air quality. On-going construction and operation of these facilities and the related impacts to air quality are considered part of the existing environmental setting and are not expected to increase in the foreseeable future.

CCR management projects have the potential to impact air quality. Emissions from the closure of ash impoundments and initial construction of the landfill would be temporary and cease once construction activities at the site are complete. Emissions from the operation of a dewatering facility and onsite landfill would be subject to applicable operating permit and fugitive dust regulations. Transportation of borrow material to GAF could result in minor, localized short-term impacts to air quality. If the reasonably foreseeable future actions occur at the same time as the proposed project, there would be potential for minor and short-term impacts to air quality. However, exceedances of applicable ambient air quality standards are not expected. Therefore no cumulative effects to air quality as a result of Alternative B are expected.

#### 3.22.3.2 Aquatic and Surface Water Ecosystems

The potential for cumulative effects to surface waters, wetlands and the aquatic environment are largely driven by the loss of WWC/ephemeral/intermittent streams within the borrow site limits of disturbance. As described in Section 3.6, impacts to WWC and ephemeral streams from the proposed action would be mitigated, as appropriate. Stream alteration associated with CCR Management activities is currently unknown as the scope of these activities has not yet been determined. However, these projects would comply with any applicable TDEC and USACE 404/401 permits obtained for the proposed actions and unavoidable impacts to resources would be mitigated, as appropriate. Additionally, BMPs would be used for all construction activities to minimize and reduce indirect impacts on receiving streams.

Given the local abundance of similar aquatic resources and wetland areas within the region, the relatively low quality of the resources potentially affected, and the implementation of BMPs during construction for all identified projects, cumulative impacts to aquatic and surface water resources at a watershed level are not anticipated.

#### 3.22.3.3 Transportation

Among the other identified actions within the geographic area, on-going construction and operation of the North Rail Loop Landfill, the SR 109 widening project, and construction of the bottom ash process dewatering facility do not have the potential to contribute to additional impacts to transportation. On-going construction and operation of these facilities and the traffic they generate are considered part of the baseline environmental setting and are not expected to increase in the foreseeable future.

The potential for cumulative effects to transportation from reasonably foreseeable future actions would be related to traffic associated with their construction phases. Traffic generated by these actions would consist of the construction workforce and the shipments

of goods and equipment to and from the construction site. The construction phase traffic would occur in addition to the existing traffic generated by the operation of GAF. However, once construction is completed, maintenance phase traffic associated with the foreseeable future projects would be negligible.

Under Alternative B, there would be a negligible temporary increase in traffic along public roads associated with the haul of borrow material to GAF. Reasonably foreseeable CCR management actions at GAF may result in roadway transport of either CCR or borrow material, depending on the selected alternative. Should ash pond closure by removal result in substantial transport of CCR to existing offsite solid waste disposal facilities, such actions would result in substantial increases in truck traffic on existing roadways. In combination with the potential outcome of these reasonably foreseeable future actions, the proposed borrow site development under Alternative A would contribute to this substantial increase in truck traffic and related traffic safety concerns. However, if ash pond closure results in transport to a planned onsite landfill such transportation related effects would be minimized such that cumulative effects from roadway transportation would be minor.

#### 3.22.3.4 Noise

Among the other identified actions within the geographic area, on-going construction and operation of the North Rail Loop Landfill, the SR 109 widening project, and construction of the bottom ash process dewatering facility do not have the potential to contribute to additional impacts to noise. On-going operations of these facilities and the related impacts to noise are considered part of the baseline environmental setting and are not expected to increase in the foreseeable future.

As described above, reasonably foreseeable CCR management actions at GAF may result in roadway transport of either CCR or borrow material, depending on the selected alternative. Should ash pond closure by removal result in substantial transport of CCR to existing offsite solid waste disposal facilities, such actions would result in substantial increases in truck traffic and related noise emissions. In combination with the potential outcome of these reasonably foreseeable future actions, the need to obtain borrow from one or more previously permitted commercial sites within 30 miles of GAF under Alternative A would contribute to this substantial increase in truck traffic and would incrementally contribute to greater noise emissions. However, if ash pond closure results in transport to a planned onsite landfill, such transportation related effects would be minimized such that cumulative effects from transportation on public roadways would be minor.

By comparison, impacts associated with the use of public roadways to transport borrow under Alternative B is expected to result in a substantially lower amount of vehicle miles traveled on a daily basis as compared to Alternative A. Therefore, Alternative B would result in a relatively insignificant increase in regional truck traffic and would not result in an increased cumulative effect on noise levels of receptors along regional roadways regardless of disposition of CCR (onsite vs. offsite landfill) as part of ash pond closure activities.

# 3.23 Unavoidable Adverse Impacts

Unavoidable adverse impacts are the effects of the proposed action on natural and human resources that would remain after mitigation measures or BMPs have been applied. Mitigation measures and BMPs are typically implemented to reduce a potential impact to a level that would be below the threshold of significance as defined by the CEQ and the

courts. Impacts associated with the proposed activities have the potential to cause unavoidable adverse effects to natural and human environmental resources.

Specifically, temporary impacts to water quality from runoff could impact nearby receiving water bodies during initial construction activities. Adverse impacts would also occur to three perennial streams and 7 WWCs/ephemeral streams located within the proposed borrow site limits of disturbance. In addition, soil excavation and transport of soil would generate noise and fugitive dust; however, fugitive dust controls are in place and workers use appropriate protection and adhere to safety standards designed to minimize worker-related injuries.

With the application of appropriate BMPs and adherence to permit requirements, these unavoidable adverse effects would be minor.

# 3.24 Relationship of Short-Term Uses and Long-Term Productivity

NEPA requires a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. This EA focuses on the analyses of environmental impacts associated with the development of a borrow site and construction of an access road. For the purposes of this section, these activities are considered short term uses of the environment, and the long term is considered to be upon the cessation of borrow activities.

Most environmental impacts during construction activities would be relatively short term and would be addressed by BMPs and mitigation measures. Construction activities would have a limited, yet favorable short-term impact to the local economy through the creation of construction jobs and associated revenue.

Because GAF is dedicated to power production, no loss of productivity of other natural resources is anticipated. Upon cessation of borrow excavation, the borrow sites would be regraded and stabilized and would eventually provide wildlife habitat which would have a beneficial impact on long-term productivity.

# 3.25 Irreversible and Irretrievable Commitments of Resources

A resource commitment is considered irreversible when impacts from its use would limit future use options and the change cannot be reversed, reclaimed, or repaired. Irreversible commitments generally occur to nonrenewable resources such as minerals or cultural resources and to those resources that are renewable only over long time spans, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for use by future generations until reclamation is successfully applied. Irretrievable commitments generally apply to the loss of production, harvest, or other natural resources and are not necessarily irreversible.

Resources required by construction activities, including labor, fossil fuels and construction materials, would be irretrievably lost. However, it is unlikely that their limited use in these projects would adversely affect the overall future availability of these resources.

The excavation and transport of borrow material to GAF would be both an irreversible and irretrievable commitment of resources. Productive soils from the borrow site would be removed, but would cover areas within GAF with productive soils that would support vegetation. Restoration of the borrow site would return this area to some productive status. However, because soil formation is a long-term process, the redevelopment of productive

soils is only expected to occur over very long time spans. Thus, the loss of vegetation until the area is successfully reclaimed would be an irreversible and irretrievable commitment of resources.

Under Alternative B, the clearing of trees would constitute an irretrievable short term and long-term loss of wildlife habitat and vegetation. Until the area is successfully reclaimed (i.e., revegetated), the loss of these habitats would be an irretrievable, but not an irreversible commitment of resources.

# **CHAPTER 4 – LIST OF PREPARERS**

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Experience:	5 years conducting field biology, 1.5 years technical writing and compliance with NEPA and ESA
Name:	Elizabeth B. Hamrick
Education:	M.S., Wildlife and B.S. Biology
Project Role:	Terrestrial Ecology (Animals), Terrestrial Threatened and Endangered Species
Experience:	17 years conducting field biology, 12 years technical writing, 8 years compliance with NEPA and ESA.
Name:	Robert Marker
Education:	B.S., Outdoor Recreation Resources Management
Project Role:	Parks and Recreation
Experience.	management.
Name	Craig Phillips
Education	M.S. and B.S., Wildlife and Fisheries Science
Project Role:	Aquatic Ecology and Threatened and Endangered Species
Experience:	7 years sampling and hydrologic determination for streams
	and wet-weather conveyances; 5 years in environmental reviews.
Name:	Kim Pilarski-Hall
Education:	M.S., Geography, Minor Ecology
Education: Project Role:	M.S., Geography, Minor Ecology Wetlands and Natural Areas

Experience:	20 years of expertise in wetland assessment, wetland monitoring, watershed assessment, wetland mitigation restoration as well as NEPA and Clean Water Act compliance.
Name: Education: Project Role: Experience:	<b>Tom Waddell</b> B.S., Chemical Engineering Air Quality 29 years in air permitting and compliance, regulatory development, and air pollution research.
Name: Education: Project Role: Experience:	<b>Ted Wells</b> M.A., Anthropology, Archaeology Cultural Resources 15 years in Archaeology and Cultural Resources Management
Name Education: Project Role: Experience:	<ul> <li>A. Chevales Williams</li> <li>B.S. Environmental Engineering</li> <li>Surface Water</li> <li>13 years of experience in water quality monitoring and compliance; 12 years in NEPA planning and environmental services.</li> </ul>
Name: Education: Project Role: Experience:	<b>Carrie Williamson, P.E., CFM</b> B.S. and M.S., Civil Engineering Floodplains 5 years Floodplains, 3 years River Forecasting, 1 year NEPA Specialist, 7 years compliance monitoring.
<b>Wood</b> Name: Education: Project Role: Experience:	Karen Boulware M.S., Resource Planning and B.S., Geology NEPA Lead. Public Health and Safety, Land Use 25 years of professional experience in NEPA.
Name: Education: Project Role:	<b>Joel Budnik</b> M.S. and B.S., Wildlife and Fisheries Sciences Threatened and Endangered Species, Wildlife and Vegetation Review
Experience:	19 years of experience in environmental planning, NEPA analysis and documentation, ecological studies, and preparation of technical documents.
Name: Education: Project Role: Experience:	Ray Finocchiaro Ph.D. Soils, M.S. Nat. Resources Management /Wetland Ecology, B.A. Biology Soils 14 years' experience in ecological studies.

Name: Education: Project Role Experience:

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Name: Education: Project Role: Experience:

Name Education Project Role Experience:

Name: Education: Project Role: Experience:

Name: Education: Project Role: Experience: Linda Hart

B.S., Business/Biology Technical Editing 30 years of experience in production of large environmental documents including technical editing, formatting, and assembling.

#### **Connie Heitz**

M.P. A. Environmental and Natural Resource Management, B.S. Public Affairs Technical Review, Public Health and Safety 25 years in environmental and land use planning

#### Tom Hensel

1984 BS Science (Major Geology) Geology and Groundwater 28 years of experience as a professional geologist for geologic, geotechnical, and environmental projects.

#### **Emily Kinzinger**

B.S., Environmental Science Socioeconomic, EJ, Naturals Areas, Parks and Recreation, Solid and Hazardous Waste 4 years of experience in NEPA

#### Stephanie Miller

M.S., Biology and B.S., Marine Biology Land Use and Prime Farmland, Visual Resources 8 years of experience in visual assessment, land use, aquatic and terrestrial ecology

#### Keara Pringle

M.S., Environmental Science and B.S., Biology NEPA Section Author 2 years of professional experience in the environmental industry providing wetland delineations, vegetation surveys, threatened and endangered species habitat assessments, fish surveys, and water quality analysis

#### Kendra Rogers

B.S., Architectural Engineering Transportation and Noise 3 years of transportation experience

#### Stan Rudzinski

M.S., Biology; B.S., Wildlife Management Senior Biologist 29 years of experience conducting and managing field studies and permitting for industrial, commercial, and federal clients. This page intentionally left blank

# CHAPTER 5 – ENVIRONMENTAL ASSESSMENT RECIPIENTS

## 5.1 Federal Agencies

U.S. Army Corps of Engineers, Nashville Environmental Protection Agency U.S. Fish and Wildlife Service

# 5.2 Federally Recognized Tribes

Absentee Shawnee Tribe of Oklahoma Cherokee Nation The Chickasaw Nation Eastern Band of Cherokee Indians Eastern Shawnee Tribe of Oklahoma Kialegee Tribal Town Muscogee (Creek) Nation Shawnee Tribe Thlopthlocco Tribal Town United Keetoowah Band of Cherokee Indians in Oklahoma

# 5.3 State Agencies

Tennessee Department of Agriculture, Natural Resources Conversation Service Tennessee Department of Transportation Tennessee Department of Economic and Community Development Tennessee Department of Environment and Conservation Tennessee Wildlife Resources Agency

#### 5.4 Individuals and Organizations

Greater Nashville Regional Council

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Appendix A – Public and Agency Comments on the Draft EA and TVA's Response to Comments

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#### Appendix A – Public and Agency Comments Received on the Draft EA and TVA's Response to Comments

A draft of the EA was released for public review and comment on July 9, 2018. The availability of the Draft EA and request for comments was announced in newspapers that serve the Sumner County area, and the Draft EA was posted on TVA's Web site. TVA's agency involvement included notification of the availability of the Draft EA to local, state, and federal agencies and federally recognized tribes. Comments were accepted through August 7, via TVA's Web site, mail, and e-mail.

TVA received one comment letter from a member of the public. The remaining comments received on the draft EA were from TDEC. TVA carefully reviewed all of the comments and edited the text of the final EA as appropriate. Responses to comments raised during the comment period are provided below. A copy of each of the comments is included at the end of this section.

1. Comment: As indicated in Figure 3.2 of the EA and described in Section 3.3, seven (7) sinkholes have been identified within the footprint of the proposed borrow area. Presumably, the sinkholes identified are features characterized by topographic depressions and/or recipient to recharge from precipitation. Excavation in such areas typically results in the exposure of numerous other voids and solution features that are important for controlling subsurface drainage into the bedrock system. What level of characterization work has been performed (e.g., boring, drilling, geophysical investigations) at this site to quantify unidentified karst features and the extent of identified features? Why have these data not been presented? It is impossible to determine if characterization efforts are adequate for this Site without a review of such data. (*Commenter: Henry Julian*)

**Response:** A subsurface exploration was completed at the site for the purpose of identifying soil quantities, but not for the purpose of evaluating karst. Additional subsurface investigation is not recommended for development of a borrow site. Subsurface investigations cannot reasonably identify all features on a site. The more practical approach is to mitigate karst features that are identified during borrow site construction. Such features would be mitigated in accordance with TDEC requirements (TN Class V Injection Well Permit).

2. Comment: Section 3.3.3 indicates that TVA has developed a work plan for identification and mitigation of sinkholes in conjunction with Tennessee Class V Injection Well Permit regulations. This work plan should be included as part the EA and should be subject to public review. (Commenter: Henry Julian)

**Response:** TVA has not yet developed a work plan to mitigate the sinkholes in accordance with Class V Injection Well Permit regulations. Text in the EA has been corrected to indicate that TVA will develop a work plan for the identification and mitigation of these features when encountered on the project site. Appropriate engineering measures designed to mitigate impacts associated with sinkholes that adhere to TDEC's regulatory process prior to impacting the sinkholes will be followed.

**3. Comment:** With regard to the seven sinkhole features identified in the EA: are any of the sinkholes accessible to people? If so, I see no mention in the EA of subsurface flora and fauna inspections by qualified NEPA specialists – no identification or quantification. In the absence of such data, TVA in all likelihood will be destroying fragile karst ecosystems.

Even though inaccessible to NEPA staff, what is the likelihood that subsurface flora and fauna exist (including bats)? Did TVA NEPA specialists set up nets or recording devices at sinkhole throats to determine if bat entry/egress might be occurring. (Commenter: Henry Julian)

**Response:** The role of identifying suitable habitat for endangered species and rare ecosystems is performed by subject matter experts (biologists) not NEPA specialists. Field reviews of the action areas were performed by qualified biologists from TVA and Wood. Biologists did not observe any suitable roosting habitat for bats or other listed species in these sinkhole areas during surveys. Therefore, no additional surveys (acoustic or netting) were performed. Unless sinkholes open up to a cave system with adequate passage into sheltered areas or have rock shelters associated with them, they are not likely to provide suitable roosting habitat for bats. Additionally, listed species of bats in this region have specific temperature, air flow, and humidity requirements for use so not all caves provide suitable habitat for bats. No such suitable roosting habitat was observed during field reviews. The closest known cave is approximately 1.0 miles away across the river from the action area and would not be impacted by proposed actions.

**4. Comment:** Section 3.4.2 describes a groundwater use survey to identify usable water wells within and surrounding the proposed Site. How was this survey completed? As TVA is well aware, the use of database information for such surveys is highly inaccurate because the databases from local, state, and federal agencies are highly inaccurate. At a minimum, a door-to-door survey should be performed for such a project. (Commenter: Henry Julian)

**Response:** The well use survey was conducted using door-to-door surveys, as documented in the reference cited in the EA (Haley & Aldrich 2017). Additional detail regarding the survey has been added to the Final EA.

**5. Comment:** Considering the large size of the proposed area (178 acres), excavation depths (e.g. 22 ft), and permanent modifications to sinkhole drainage, the local subsurface recharge (at site scale) will be unavoidably changed. More water will recharge some areas of the soil and bedrock systems, and the converse will occur elsewhere. In addition to permanently affecting unforeseen flora and fauna, there is also a potential for affecting groundwater levels at private wells. For example, seasonal groundwater levels might be reduced at a private well, thereby increasing the pumping cost for a homeowner due to increased head. There is also a likelihood that site modifications could create a permanently "dry" well for a homeowner. Such potential issues should be addressed via mitigation in the EA. (Commenter: Henry Julian)

**Response:** There are limited private wells nearby, and none of them are used for drinking water supply. Storm water management associated with the borrow site consists of routing storm water to existing natural drainage features, so we do not anticipate significantly disrupting the natural drainage patterns. In addition, the identified sinkholes appear to have limited drainage areas, so routing drainage away from them is likely to have little overall effect on groundwater.

6. Comment: Karst researchers all understand the potential for subsidence that can result due to alteration of subsurface drainage at a site such as this. It is also generally recognized that subsidence can be highly unpredictable – but it does occur. Again,

considering the large scale of the site, and realizing that subsurface drainage will be permanently changed, mitigation methods should be considered for subsidence that might occur on surrounding private properties. *(Commenter: Henry Julian)* 

**Response:** We do not anticipate off-property impacts as a result of removing borrow soil from the site. The identified sinkholes appear to have limited drainage areas and sinkhole mitigation will be completed by methods that avoid creating significant changes to surface drainage patterns, therefore minimizing the potential for impacts to surrounding private properties.

7. Comment: Continuous groundwater level monitoring should be performed within and surrounding the proposed site prior to construction, during construction, and following construction to gage changes in groundwater elevations that will result from site modifications. Likewise, flow of local springs and streams that might be influenced by site modifications should be measured continuously or on a routine basis (prior to construction, during construction, and following construction) to gage the impact of site modifications. (Commenter: Henry Julian)

**Response:** TVA is planning on installing one monitoring well cluster (3 wells) at the borrow site in association with other ongoing projects at Gallatin. Groundwater levels may be monitored during and following construction.

- 8. Comment: Section 2.2, Table 2.2 (Geology and Soils, and Groundwater) indicates that site alterations and sinkhole mitigation are anticipated to result in "minor" impacts. Strongly disagree. For a project of this scale and given the karst setting with numerous sinkholes, impacts will significant. There are numerous unknowns but excavation and subsurface drainage alterations will result in problems. I cannot recall a single TVA fossil plant (or other facility for that matter) residing in karst terrain that has not resulted in costly remedies. Here are a few:
  - Kingston Fossil Plant, Peninsula CCR Disposal Facility: early construction issues associated with sinkhole development, design alterations, catastrophic sinkhole collapse with pond contents pouring into Clinch River, design alterations for liner. These were multi-million dollar costs.
  - Colbert Fossil Plant CCR Ponds: loss of pond aqueous contents to river via sinkhole development beneath unlined CCR ponds on more than one occasion. Ultimately early Site closure due to offsite groundwater contamination associated with CCR leachate via bedrock solution features. Repairs over time and closure were multi-million dollar costs.
  - Widows Creek Fossil Plant, Phase II FGD Facility: breach of pond bottom via sinkhole development and transport of CCR leachate contaminants to private spring and other private properties. Purchase of adjacent private properties as remedy. Site closure. Presumably accrued costs of millions.
  - Gallatin Fossil Plant, CCR Ponds: breach of pond bottoms via sinkhole development and transport of CCR leachate contaminants to river. Ongoing remediation projects associated with CCR leachate to groundwater. Presumably accrued costs of millions. (*Commenter: Henry Julian*)

**Response**: The borrow site is located 1.5 miles northwest of GAF and up gradient. In addition, the borrow site is not in the vicinity of any CCR material. Therefore, CCR contamination at the borrow site is extremely unlikely. Any sinkhole and karst features that are encountered will be mitigated in accordance with TDEC requirements (TN Class V

Injection Permit). With this mitigation/best practices in place, Impacts are not anticipated to be significant. See also responses to comments #5 and #6.

**9. Comment:** TDEC concurs that there is potential for the state listed Streamside Salamander (*Ambystoma barbouri*) to occur within wet weather conveyances (WWC) of the proposed borrow site project area. If exotic vegetation removal is required for this project, TDEC encourages use of methods that will lessen impacts to the Streamside Salamander and the water quality of the streams on site. TDEC recommends that the Final EA include additional information regarding legal requirements TVA must follow to ensure protection of the Streamside Salamander. (*Commenter: TDEC*)

**Response:** Field surveys for *Ambystoma barbouri* at the Gallatin Borrow Site were performed jointly by subject matter experts from TDEC and TVA on March 22, 2018. No individuals or egg masses of this species were found despite the presence of suitable habitat along the blue line stream. Although no definitive statements can be made as to why this species is not present on site, we speculate that it may be due to too much water or a high water gradient in the stream, or perhaps too much competition for resources in the area. WWC may provide travel corridors but are unlikely to provide suitable breeding grounds for the species due to lack of sufficient water flow for long enough periods of time. These field survey results were provided to Robert Todd of Tennessee Wildlife Resources Agency (TWRA) after which he determined no adverse impacts to state-listed species under TWRA's authority are anticipated. Despite negative survey results for *A. barbouri* TVA would use Best Management Practices along all remaining streams and wet weather conveyances on site to minimize impacts. Any impacts to streams would be appropriately mitigated for using BMPS and appropriate regulatory requirements.

10. Comment: Vinson Cemetery (40SU322) and two sites potentially-eligible for the National Register of Historic Places (40SU341 and 40SU342) exist within the area of potential effect (APE.) However, if TVA adheres to proposed avoidance measures there should be no adverse effect on cultural resources. If human remains are encountered or accidentally uncovered by earthmoving activities, all activity within the immediate area must cease. The county coroner or medical examiner, a local law enforcement agency, and the state archaeologist's office should be notified at once (Tennessee Code Annotated 11-6- 107d). A court order from Chancery Court must be obtained prior to the removal of any human graves. TDEC recommends the Final EA include discussion relating to TVA protocols for encountering and addressing human remains. (Commenter: TDEC)

**Response:** Concur. Text has been added to the Final EA which identifies TVA protocols for encountering and addressing human remains.

**11. Comment:** Section 3.1.1.1 "Regulatory Framework for Air Quality" states "Sumner County is in attainment with applicable [National Ambient Air Quality Standards] NAAQS ([Environmental Protection Agency] EPA 2018d) and Tennessee ambient air quality standards referenced in the Tennessee Air Pollution Control Regulations Chapter 1200-3-3." The Tennessee ambient air quality standards referenced in Chapter 1200-3-3 are not up to date with respect to current NAAQS. All comparisons to the NAAQS standards and any nonattainment designation discussion should focus on the federally enforceable NAAQS and the federal ambient air quality designations made by EPA (which are those that are currently effective in Tennessee). EPA completed the Round 2 Area Designations for Sulfur dioxide (SO2) in June and November of 2016 and at that time classified Sumner County, Tennessee as Unclassifiable with respect to the 1-Hr SO2 NAAQS. Sumner County is

currently classified as attainment/unclassifiable for all other NAAQS criteria pollutants. TDEC recommends that TVA include this correction in the Final EA. (*Commenter: TDEC*)

**Response:** Concur. Text has been added to the Final EA to update the attainment status of Sumner County.

12. Comment: The Draft EA outlines potential permitting requirements for TVA's proposed action, which includes a TDEC Aquatic Resources Alteration Permit (ARAP) and 401 Water Quality Certification for any alterations to streams and wetlands on the affected area. As part of the ARAP permitting and review process, an alternative approaches to avoid stream and wetland related project impacts. Any impacts to stream features will require mitigation through a stream mitigation bank or in-lieu fee program, if credits are available, or TVA will be required to find a suitable site and design a permittee responsible mitigation plan to offset the proposed elimination of water resources. TDEC encourages TVA to consider alternative approaches to reduce potential aquatic resource impacts and include related discussion in the Final EA. (Commenter: TDEC)

**Response:** Concur. TVA will adhere to all terms and conditions of all applicable permits.

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Appendix B – Conceptual Plans



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DESIGNED BY: DRAWN BY: CHECKED BY: DES GWL REVISED BY: REVIEWED BY: MDW DW DES GWL RBC MST JCK GALLATIN FOSSIL PLANT TENNESSEE VALLEY AUTHORITY FOSSIL AND HYDRO ENGINEERING AUTOCAD 2017 8/17/18 39 C 10W326-08 R D PLOT FACTOR:XX W\_TVA C.A.D. DRAWING DO NOT ALTER MANUALLY




— - – Phase Boundary

—— Stream and Wet Weather Conveyance

Area of Potential Future Disturbance

TVA Gallatin Fossil Plant Property Boundary (Approximate)

> 0 500 Feet

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1,000	JOSH.COLLEY	D.SKEGGS GALLATIN F NESSEE VAI	APPROVED BY: OSSIL PLANT LLEY AUTHORI	REVISION NUMBER: REV. 0
	date: 9/25/2018	FOSSIL A	ND HYDRO EN	GINEERING

560 550 TREE BUFFER -EXISTING GRADES -540 ELEVATION 530 EXISTING STREAM PROPOSED EXCAVATION 520 -PROPOSED EXCAVATION 510 2+00 3+00 5+00 6+00 0+00 1+00 4+00

STATION

FUTURE BORROW AREA CROSS-SECTION A-A'



Appendix C – Bat Strategy Project Assessment

From:	Hamrick, Elizabeth Burton
To:	<u>"robbie_sykes@fws.gov";</u>
Subject:	RE: Project-specific notification in accordance with TVA Programmatic Consultation for Routine Actions and Federally listed bats
Date:	Wednesday, September 19, 2018 12:48:19 PM
Attachments:	Completed 425629 GAF-Borrow-Site-EA TVA-Bat-Strategy 2018-06-11.pdf
	image001.png
	image002.png
	image003.png
	image004.png
	image005.png
	image006.png
	image007.png
	image008.png

Good afternoon,

TVA's programmatic ESA consultation on routine actions and bats was completed in April 2018.

For projects with NLAA or LAA determinations, TVA will be providing project-specific notification to relevant Ecological Service Field Offices. This notification also will be stored in the project administrative record. For projects that utilize Take issued through the Biological Opinion, that Take will be tracked and reported in TVA's annual report to the USFWS in March of the following year.

The attached form is serving at TVA's mechanism to determine if project-specific activities are within the scope of TVA's bat programmatic consultation and if there is project-specific potential for impact to covered bat species, necessitating conservation measures, which are identified for the project on pages 6-11. The form also is serving as the primary means of notification to the USFWS and others as needed.

**Project:** 425629 Gallatin Steam Plant – Borrow Site Environmental Assessment – Sumner County, Tennessee. Development of borrow site for on-going GAF plant operations. Thirty-seven acres of potentially suitable summer roosting habitat for MYSO and MYSE would be removed immediately during while bats are volant. Project expects to remove the vast majority of trees in winter, but potentially up to 1 acre of forest would be removed Aug 1-Oct 14. Trees would not be removed June – July when pups are non-volant.

Thank you,

**Liz Hamrick** Terrestrial Zoologist Biological Compliance

400 W Summit Hill Dr. WT 11C-K Knoxville, TN 37902

865-632-4011 (w) ecburton@tva.gov



RESTRICTED, or TVA CONFIDENTIAL. Any misuse or unauthorized disclosure can result in both civil and criminal penalties. If you are not the intended recipient, be aware that any disclosure, copying, distribution, or use of the content of this information is prohibited. If you have received this communication in error, please notify me immediately by email and delete the original message.

# Project Screening Form - TVA Bat Strategy (05/08/2018)

This form is to assist in determining alignment of proposed projects and any required measures to comply with TVA's ESA Section 7 programmatic consultation for routine actions and federally-listed bats<sup>1</sup>

Project Name:			Date:
Contact(s):	CEC#:	RLR#:	_ Project ID:

Project Location (City, County, State):\_\_\_\_\_

Project Description: \_\_\_\_\_

# STEP 1) Select Appropriate TVA Action (or check here $\Box$ if none of the Actions below are applicable):

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

# **STEP 2)** Select <u>all</u> activities from **Tables 1 and 2** (<u>Column 1 only</u>) included in proposed project. If you have an activity that is not listed below, describe here): \_\_\_\_\_\_

# Table 1. Activities (CHECK ALL THAT APPLY) with No Effect on Federally Listed Bats. If none, check here:

#	ACTIVITY	#	ACTIVITY
□ 1	Loans and/or grant awards	12	Sufferance agreement
□ 2	Purchase of property	13	Engineering or environmental planning or studies
□ 3	Purchase of equipment for industrial facilities	14	Harbor limits
□ 4	Environmental education	19	Site-specific enhancements in streams and reservoirs for aquatic animals
□ 5	Transfer of ROW easement or ROW equipment	20	Nesting platforms
□ 6	Property and/or equipment transfer	41	Minor water-based structures
<b>-</b> 7	Easement on TVA property	42	Internal renovation or internal expansion of existing facility
□ 8	Sale of TVA property	43	Replacement or removal of TL poles, or cutting of poles to 4-6 ft above ground
. 9	Lease of TVA property	44	Conductor and OHGW installation and replacement
□ 10	Deed modification of TVA rights or TVA property	49	Non-navigable houseboats
□ 11	Abandonment of TVA retained rights		

### Table 2. Activities (CHECK ALL THAT APPLY) and Associated Conservation Measures. If none, check here:

	#		CONSERVATION MEASURES	TZ SME Review Needed
Γ		Windshield or ground surveys for	□ a. NV1	
	□ 1	15 archaeological resources	□ <mark>b</mark> . HP2	□ <mark>b</mark> . HP1
ſ			□ a. NV1	□ a NV3, NV4 / □ a1. NV2
			□ f. SSPC1, SSPC2, SSPC3	
	□ 1	16 Drilling	🗆 g. L1, L2	
ſ		Mechanical vegetation removal;		
		does not include removal of trees or	<sup>.</sup> □ <mark>a</mark> . NV1	
	□ 1	<b>17</b> tree branches $\geq$ 3" in diameter.	□ f. SSPC1, SSPC2, SSPC3, SSPC5	□ <mark>f</mark> . SSPC4, SSPC7
ſ			□ a. NV1	
	□ 1	18 Erosion control – minor	□ f. SPCC1, SSPC2, SSPC3, SSPC5	None
Γ	□ 2	21 Herbicide use	d. SSPC1, SSPC2, SSPC3, SSPC5	□ d. SSPC6, SSPC7
Γ			□ <mark>a.</mark> NV1	
	□ 2	22 Grubbing	□ f. SSPC1, SSPC2, SSPC3, SSPC5	□ f. SSPC4
ſ	. 2	23 Prescribed burns, burn piles, or	□ c. SHF1, SHF4, SHF5	□ c. SHF2, SHF3, SHF6, SHF7,

	#	ACTIVITY	CONSERVATION MEASURES	TZ SME Review Needed
		brush piles		SHF8, SHF9
			□ a NV1	
	24	Tree planting	□ f. SSCP1, SSPC2, SSPC3, SSPC5	None
		Maintenance, improvement or	🗆 <mark>a.</mark> NV1	□ a1. NV2
		construction of pedestrian or	□ f. SSPC1, SSPC2, SSPC3,	
	25	vehicular access corridors	SSPC5	
				□ a NV3, NV4 / □ a1. NV2
		Maintenance or construction of	$\square D. \Pi Z$ $\square f SSPC1 SSPC2 SSPC3 SSPC5$	
	26	access control measures	$\square a   1   2$	
		Restoration of sites following	a. NV1	
	27	human use and abuse	□ f. SSPC1, SSPC2, SSPC3	□ f. SSPC7
		Removal of debris (e.g., dump		
		sites, hazardous material,	□ <mark>a</mark> . NV1	
	28	unauthorized structures)	□ f. SSPC1, SSPC2, SSPC3	□ f. SSPC7
_	20	Acquisition and use of fill/borrow		
	29	material	□ 1. 35PC1, 35PC2, 35PC3	□ I. 55PC7
	30	harbor areas	$\square f$ SSPC2 SSPC3 SSPC5	None
			□ a. NV1	
	31	Stream/wetland crossings	□ f. SSPC1, SSPC2, SSPC3, SSPC5	□ f. SSPC7
		<u>0</u>	□ a. NV1	
	32	Clean-up following storm damage	□ f. SSPC1, SSPC2, SSPC3	□ f. SSPC4, SSPC7
			□ a. NV1	🗆 d. TR1, TR2, TR3, TR4,
		Removal of hazardous trees or tree	□ d. TR7, TR8	TR5, TR6, TR9,
	33	branches	□ f. SSPC1, SSPC2, SSPC3, SSPC5	□ f. SSPC4, SSPC7
		includes trees or tree branches	$\square$ <b>a</b> . NV1	0. IR1, IR2, IR3, IR4,
	34	three inches or greater in diameter	$\square \mathbf{f}$ SSPC1 SSPC2 SSPC3 SSPC5	$\square f$ SSPC4 SSPC7
	54			
	35	Stabilization (major erosion control)	□ f. SSPC1, SSPC2, SSPC3, SSPC5	□ f. SSPC4, SSPC7
			□ a. NV1	
			□ f. SSPC1, SSPC2, SSPC3, SSPC5	□ f. SSPC4, SSPC7
	36	Grading	🗆 g. L1, L2	
			□ a. NV1	□ a1. NV2
	27		□ f. SSPC1, SSPC2, SSPC3	□ f. SSPC7
	31	Installation of soil improvements		
		Drainage installations (including for	$\square f SSPC1 SSPC2 SSPC3$	□ f SSPC7
	38	ponds)	a, L1, L2	
			□ <mark>a.</mark> NV1	
			□ f. SSPC1, SSPC2, SSPC3,	
	39	Berm development	🗆 g. L1, L2	None
		Closed loop heat exchangers (heat	£ 00005	Nega
	40	pumps) Stream monitoring, and in mont	<u> 1. SSPU5</u>	None
_	45	Suream monitoring equipment-		None
		Floating boat slips within approved		
	46	harbor limits	□ f. SSPC5	None
	47	Conduit installation	□ a. NV1	□ a1. NV2
			□ <mark>a.</mark> NV1	
			□ f. SSPC1, SSPC2, SSPC3,	
	48	Laydown areas	□ g. L1, L2	None
	50	Minor land-based structures	1. 33761, 33762, 33763, 33765    a   1   2	None
	50	ואוויטי ומווע-שמשכע שוועטנעופש	u g. c., cz	
	51	Signage installation	□ f. SSPC1, SSPC2, SSPC3, SSPC5	None
	<u> </u>		□ a. NV1	□ a1. NV2
			□ f. SSPC2, SSPC3,SSPC5	
	52	Floating buildings	🗆 g. L1, L2	
	53	Mooring buoys or posts	□ a. NV1	

	#	ACTIVITY	CONSERVATION MEASURES	TZ SME Review Needed
			□ f. SSPC2, SSPC3, SSPC5	None
		Maintenance of water control		
		structures (dewatering units,	□ <mark>a</mark> . NV1	□ f. SSPC6, SSPC7
	54	spillways, levees)	□ f. SSPC2, SSPC3, SSPC5	
			□ <mark>a.</mark> NV1	
	55	Solar panels	□ f. SSPC2, SSPC3, SSPC5	□ <mark>f</mark> . SSPC7
			□ a. NV1	
	56	Culverts	□ f. SSPC1, SSPC3, SSPC5	None
			□ a. NV1	
	57	Water intake - non-industrial	□ f. SSPC3, SSPC5	None
			□ a. NV1	
	58	Wastewater outfalls	□ f. SSPC2, SSPC3, SSPC5	None
_	50	Marina fueling facilitian	$\Box$ T. SSPC2, SSPC3,	Nene
	23		$\frac{55PC5}{2} = \frac{9.11}{2}$	None
		Commercial water use facilities	$\Box f SSPC2 SSPC5$	
	60	(e a marinas)	$\Box \alpha 1 1 1 2$	None
	00	(c.g., mannas)	a NV/1	
	61	Sentic fields	□ f SSPC1 SSPC2 SSPC3 SSPC5	None
	•••		a NV1	$\square a NV3 NV4 / \square a1 NV2$
			□ f. SSPC1. SSPC2. SSPC3.	
	62	Blasting	□ q. L1, L2	
			□ a. NV1	□ a1. NV2
	63	Foundation installation	□ f. SSPC1, SSPC2, SSPC3	
		Installation of steel structure,	🗆 a. NV1	□ a1. NV2
	64	overhead bus, equipment, etc.	□ g. SSPC1, SSPC2, SSPC3	
		Pole and/or tower installation	□ <mark>a</mark> . NV1	□ a1. NV2
	65	and/or extension	□ f. SSPC1, SSPC2, SSPC3	
			□ <mark>a</mark> . NV1	
		Private, residential docks, piers,	□ f. SPCC5	
	66	boathouses	🗆 g. L1, L2	None
	~ 7		□ f. SSPC1, SSPC2, SSPC3, SSPC5	
	67	Siting of temporary office trailers	□ g. L1, L2	None
_	60	Financing for speculative building		Nene
	00			None
			$\Box f SSDC1 SSDC3 SSDC5$	
	69	Renovation of existing structures	$\square n   1   2$	$\Box C. ART, ARZ, ARZ, ARZ$
			a NV/1	$\Box$ a1 NV2
	70	Lock maintenance and construction	□ f. SSPC2, SSPC3, SSPC5	
			□ a. NV1	□ a1. NV2
	71	Concrete dam modification	□ f. SSPC2. SSPC3	
			□ a. NV1	
			□ f. SSPC5	
	72	Ferry landings/service operations	🗆 g. L1, L2	None
			□ <mark>a</mark> . NV1	□ a1. NV2
	73	Boat launching ramps	□ f. SSPC2, SSPC5	
			□ a. NV1	
	74	Recreational vehicle campsites	🗆 g. SPCC5	None
			□ a. NV1	
			t. SPCC5	
	75	Utility lines/light poles	□ g. L1, L2	None
				Nana
	16			
	1	Construction or expansion of land		
	77	based buildings	11. 33502, 33703, 33703	
	11	มลออน มนแนแญร		□ 21 NV/2
1	1		$\Box f SSPC2 SSPC5$	
	78	Wastewater treatment plants	[a] 1 12	
	70			
	19	Swimming pools and associated		

	#	ACTIVITY	CONSERVATION MEASURES	TZ SME Review Needed
		equipment	□ f. SSPC5	
			🗆 g. L1, L2	None
			□ <mark>a</mark> . NV1	□ a1. NV2
	80	Barge fleeting areas	I. SSPC2, SSPC3, SSPC5	
			□ <mark>a</mark> . NV1	
	81	Water intakes - Industrial	I. SSPC2, SSPC3, SSPC5	None
			□ <mark>a</mark> . NV1	□ a1. NV2
	82	Construction of dam/weirs/ Levees	In f. SPCC2, SPCC3, SPCC5	
		Submarine pipeline, directional	□ a. NV1	□ a1. NV2
	83	boring operations	I f. SSPC2, SSPC3, SSPC5	
		On-site/off-site public utility		
		relocation or construction or	□ <mark>a</mark> . NV1	
	84	extension	I. SSPC1, SSPC3, SSPC5	None
			□ <mark>a</mark> . NV1	
	85	Playground equipment - land-based	f. SSPC5	None
			□ <mark>a</mark> . NV1	□ a1. NV2
			□ f. SSPC2, SSPC3	
	86	Landfill construction	□ g. L1, L2	
			□ a. NNV1	
	87	Aboveground storage tanks	□ f. SSPC2, SSPC3, SSPC5	None
	88	Underground storage tanks (USTs)	□ g. SSPC2, SSPC3, SSPC5	None
	89	Structure demolition	□ f. SSPC1, SSPC2, SSPC3	□ e. AR1, AR2, AR4, AR5
			□ a. NV1	
	90	Pond closure	□ f. SSPC2, SSPC3	None
	~		□ a. NV1	
	91	Bridge replacement	□ f. SSPC3, SSPC5	□ e. AR1, AR2, AR3, AR5,
	~~	Return of remains to former burial		
	92	SITES		□ <mark>0</mark> . HP1
	00	Standard lisansa		None
	93			None
	94	Special use license	□ <b>a</b> . NV1	None
	0.5	Descretion lissnes		Nega
	95	Recreation license		None
1	0			Nega
	90	Land use permit	0 I. 33PU3	None

**STEP 4)** Check <u>ALL</u> relevant characteristics below. If **none** apply, **STOP HERE** and check . <u>No Bat Strategy</u> <u>Conservation Measures required</u>. Include form in environmental documentation <u>and</u> send to <u>batstrategy@tva.gov</u>

- a. Project may occur outside, involves human presence, or use of equipment that generates noise or vibration (e.g., drilling, blasting, loud machinery).
  - $\Box$  a1. Project involves continuous noise (i.e.,  $\geq$  24 hrs) that is >75 decibels measured on A scale (e.g., loud machinery).
- □ b. Project may involve human entry into/survey of a potential bat roost (cave, bridge, other structure).
- c. Project may involve fire (e.g., prescribed fire, burn piles) or preparation of fire breaks within 0.25 mi of trees, caves, or water sources. If prescribed burn, estimated acreage: \_\_\_\_\_

<ul> <li>d. Project may involve tree removal.</li> <li>Tree removal may need to occur outside of winter.</li> <li>Tree removal will occur only in winter.</li> </ul>	YES □ NO YES □ NO
Estimated number of trees or acres to be removed: □ acres □ trees If warranted, project has flexibility for bat surveys (May 15-Aug 15):	MAYBE 🛛 YES 🗆 NO

- □ e. Project may involve alteration or removal of bridges or other human structures.
- In f. Project may involve land use activities involving ground disturbance or use of chemicals or fuels near water sources, wetlands, sinkholes, caves, or exposed limestone/karst.
- □ g. Project may involve use of artifical lighting at night.

<u>Terrestrial Zoologist SME Verification (Steps 6-11 will be completed by a terrestrial zoologist if warranted)</u>: STEP 6) Project is within range of: Gray bat VA Big-eared bat Indiana bat Northern long-eared bat

STEP 7a) Project includes the following:

- Removal/burning of suitable trees within 0.5 mile (0.8 km) of P1-P2 Indiana bat hibernacula or 0.25 mile (0.4 km) of P3-P4 Indiana bat hibernacula or any northern long-eared bat hibernacula.
- Removal/burning of suitable trees within 10 miles of documented Indiana bat hibernacula or within 5 miles of northern long-eared bat hibernacula.
- Removal/burning of suitable trees greater than 10 miles from documented Indiana bat hibernacula or greater than 5 miles from documented northern long-eared bat hibernacula.
- Removal/burning of trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity roost tree.
- Removal/burning of suitable trees within 2.5 miles of Indiana bat roost trees or within 5 miles of Indiana bat capture sites.
- Removal/burning of suitable trees greater than 2.5 miles from Indiana bat roost trees or greater than 5 miles from Indiana bat capture sites.
- □ Removal/burning of documented Indiana bat or northern long-eared bat roost tree, if still suitable.

STEP 7b) Amount of SUITABLE tree/acreage removal or burned (may be different than total amount of

removal): \_\_\_\_\_ acres trees

STEP 8) Select anticipated date range of burning/tree removal in table below:

STATE	SWARMING	WINTER	NON-WINTER	PUP
GA, KY, TN	Oct 15 - Nov 14	Nov 15 - Mar 31	□ Apr 1 - May 31, Aug 1- Oct 14	🗆 Jun 1 - Jul 31
VA	Sep 16 - Nov 15	Nov 16 - Apr 14	□ Apr 15 - Sep 15	🗆 Jun 1 - Jul 31
AL	Oct 15 - Nov 14	Nov 15 - Mar 15	□ Mar 16 - May 31, Aug 1 - Oct 14	🗆 Jun 1 - Jul 31
NC	Oct 15 - Nov 14	Nov 15 - Apr 15	□ Apr 16 - May 31, Aug 1 - Oct 14	🗆 Jun 1 - Jul 31
MS	□ Oct 1 - Nov 14	□ Nov 15 - Apr 14	□ Apr 15 - Sep 30	🗆 Jun 1 - Jul 31

STEP 9) Presence/absence surveys (visual, mist net, acoustic) were/will be conducted: 
VES 
NO 
TBD

STEP 10) Result of presence/absence surveys (if conducted), on \_\_\_\_\_\_ (date): 
NEGATIVE 
POSITIVE 
N/A NOTES: \_\_\_\_\_

**STEP 11)** Conservation measures have been verified (and modified, if necessary) in Table 2. *NOTES*:

### Bat Strategy Compliance Verification (Steps 12-15 will be completed by SME/Bat Strategy Support staff):

**STEP 12)** Project  $\square$  WILL  $\square$  WILL NOT require use of Incidental Take in the amount of \_\_\_\_\_  $\square$  acres or  $\square$  trees, proposed to be used during the  $\square$  WINTER  $\square$  VOLANT  $\square$  NON-VOLANT bat season (or  $\square$  N/A).

STEP 13) Available Incidental Take as of \_\_\_\_\_ for \_\_\_\_\_

TVA Action	Total 20-year	Winter	Volant Season	Non-Volant Season
	acreage	Burning/Removal	Burning/Removal	Burning/Removal

STEP 14) Amount contributed to TVA's Bat Conservation Fund upon activity completion: \_\_\_\_\_\_ or D N/A

STEP 15) Project Effects Determinations: Gray Bat: NE NLAA N/A; Virginia Big-eared Bat: NE NLAA N/A Northern Long-eared Bat: NE NLAA LAA N/A; Indiana Bat: NE NLAA LAA N/A

NOTES:\_\_\_

(Action):

# TVA's ESA Section 7 Bat Strategy Conservation Measures Required for:

**STEP 16)** Based on completion of Step 5, select the appropriate Conservation Measures listed in the table below (this will be completed/verified by a Terrestrial Zoologist if a Terrestrial Zoologist review is required) and review the following bullets. Save this form in project environmental documentation AND send a copy of form to batstrategy@tva.gov. Submission of this form is an indication that the Project Lead \_\_\_\_\_\_\_ (name) is (or will be made) aware of the requirements below.

- Implementation of conservation measures identified below is required to comply with TVA's programmatic Endangered Species Act bat consultation.
- Confirmation of completion (e.g., report from contractor, time stamped photos pre and post completion) for Conservation Measures below with an \* (as well as any additional confirmation noted here by Terrestrial Zoologist:\_\_\_\_\_\_) will be provided to TVA's Bat Strategy Compliance Officer (<u>batstrategy@tva.gov</u>) following completion of activit (ies).
- TVA may conduct post-project monitoring to determine if conservation measures were effective in minimizing or avoiding impacts to federally listed bats.

**STEP 17)** For projects that require use of Take and/or contribution to TVA's Bat Conservation Fund, please acknowledge the following statement:

□ Project Lead/Contact acknowledges that proposed project will result in use of \_\_\_\_\_ □ acres/□ trees in Incidental Take and will require \_\_\_\_\_\_ contribution to TVA's Conservation Fund upon completion of activity.

Conservation	
Measure Acronym	Conservation Measure Description
NV1	Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape.
NV2	Drilling, blasting, or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a 0.5 mile radius of documented winter and/or summer roosts (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites.
NV3	Drilling or blasting within a 0.5 mile radius of documented cave (or unconventional) roosts will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the roost site.
NV4	Drilling or blasting within 0.5 miles of a documented roost site (cave, tree, unconventional roost) that needs to occur when bats are present will first involve development of project-specific avoidance or minimization measures in coordination with the USFWS.
HP1	Site-specific cases in which potential impact of human presence is heightened (e.g., conducting environmental or cultural surveys within a roost site) will be closely coordinated with staff bat biologists to avoid or minimize impacts below any potential adverse effect. Any take from these activities would be covered by TVA's Section 10 permit.
HP2	Entry into roosts known to be occupied by federally listed bats will be communicated to the USFWS when impacts to bats may occur if not otherwise communicated (i.e., via annual monitoring reports per TVA's Section 10 permit). Any take from these activities would be covered by TVA's section 10 permit.
SHF1	Fire breaks will be used to define and limit burn scope.
SHF2	Site-specific conditions (e.g., acres burned, transport wind speed, mixing heights) will be considered to ensure smoke is limited and adequately dispersed away from caves so that smoke does not enter cave or cave-like structures.
SHF3	Acreage will be divided into smaller units to keep amount of smoke at any one

	time or location to a minimum and reduce risk for smoke to enter caves.
SHF4	If burns need to be conducted during April and May, when there is some
	potential for bats to present on the landscape and more likely to enter torpor due
	to colder temperatures, burns will only be conducted if the air temperature is 55°
	or greater, and preferably 60° or greater
SHE5	Fire breaks will be plowed immediately prior to burning, will be plowed as
	shallow as possible, and will be kept to minimum to minimize sediment
	Tractor constructed fire lines will be established greater than 200 feet from cave
	ontrappos. Existing logging roads and skid trails will be used where feasible to
	minimize around disturbance and apparation of loose sediment
	Burning will only occur if site specific conditions (o.g. perce burned, transport
	build append mixing heights) can be medified to ansure that amake is adoquately
	wind speed, mixing heights) can be modified to ensure that smoke is adequately
	dispersed away from caves of cave-like structures. This applies to prescribed
01/50	burns and burn piles of woody vegetation.
SHF8	Brush piles will be burned a minimum of 0.25 mile from documented, known, or
	obvious caves of cave entrances and otherwise in the center of newly
01/50	established ROW when proximity to caves on private land is unknown.
SHF9	A 0.25 mile buffer of undisturbed forest will be maintained around documented or
	known gray bat maternity and hibernation colony sites, documented or known
	Virginia big-eared bat maternity, bachelor, or winter colony sites, Indiana bat
	hibernation sites, and northern long-eared bat hibernation sites. Prohibited
	activities within this buffer include cutting of overstory vegetation, construction of
	roads, trails or wildlife openings, and prescribed burning. Exceptions may be
	made for maintenance of existing roads and existing ROW, or where it is
	determined that the activity is compatible with species conservation and recovery
	(e.g., removal of invasive species).
TR1*	Removal of potentially suitable summer roosting habitat during time of potential
	occupancy has been quantified and minimized programmatically. TVA will track
	and document alignment of activities that include tree removal (i.e., hazard trees,
	mechanical vegetation removal) with the programmatic quantitative cumulative
	estimate of seasonal removal of potential summer roost trees for Indiana bat and
	northern long-eared bat. Project will therefore communicate completion of tree
	removal to appropriate TVA staff.
TR2	Removal of suitable summer roosting habitat within 0.5 mile of Priority 1/Priority
	2 Indiana bat hibernacula, or 0.25 mile of Priority 3/Priority 4 Indiana bat
	hibernacula or any northern long-eared bat hibernacula will be prohibited,
	regardless of season, with very few exceptions (e.g., vegetation maintenance of
	TL ROW immediately adjacent to a known cave).
TR3*	Removal of suitable summer roosting habitat within documented bat habitat (i.e.,
	within 10 miles of documented Indiana bat hibernacula, within five miles of
	documented northern long-eared bat hibernacula, within 2.5 miles of
	documented Indiana bat summer roost trees, within five miles of Indiana bat
	capture sites, within one mile of documented northern long-eared bat summer
	roost trees, within three miles of northern long-eared bat capture sites) will be
	tracked, documented, and included in annual reporting. Project will therefore
	communicate completion of tree removal to appropriate TVA staff.
TR4*	Removal of suitable summer roosting habitat within potential habitat for
	Indiana bat or northern long-eared bat will be tracked, documented, and
	included in annual reporting. Project will therefore communicate completion of
	tree removal to appropriate TVA staff.
TR5	Removal of any trees within 150 feet of a documented Indiana bat or northern
	long-eared bat maternity summer roost tree during non-winter season, range-
	wide pup season or swarming season (if site is within known swarming habitat).
	will first require a site-specific review and assessment. If pups are present in
	trees to be removed (determined either by mist netting and assessment of adult
	females, or by visual assessment of trees following evening emergence counts).

		TVA will coordinate with the USFWS to determine how to minimize impacts to
		pups to the extent possible. May include establishment of artificial roosts before
		removal of roost tree(s).
	TR6	Removal of a documented Indiana bat or northern long-eared bat roost tree that
		is still suitable and that needs to occur during non-winter season, range-wide
		nup season, or swarming season (if site is within known swarming habitat) will
		first require a site-specific review and assessment. If nuns are present in trees to
		be removed (determined either by mist netting and assessment of adult females
		or by visual assessment of trees following evening emergence coupte). TVA will
		coordinate with LISEWS to determine how to minimize impacts to pupe to the
		extent pessible. This may include actablishment of artificial reacts before
		removal of roost troo(c)
	TD7	Trop removal within 100 foot of <b>existing transmission POWs</b> will be limited to
		hazard trees. On or adjacent to TLs, a bazard tree is a tree that is tall enough to
		fall within an unsafe distance of TLs, a flazaru free is a free fild is fall enough to
		and/or are also doed discance of TLS under maximum say and blowout conditions
		and/or are also dead, diseased, dying, and/or reaning. Hazard free removal
		includes removal of trees that 1) currently are tail enough to threaten the integrity
		of operation and maintenance of a TL of 2) have the ability in the future to
		Inreaten the integrity of operation and maintenance of a TL.
	IRO	Requests for removal or hazard trees on or adjacent to <b>TVA reservoir rand</b> will
		Seciety of Arboriculture and TVA's checklist for bezord trace. Approval will be
		Society of Arbonculture and TVA's checklist for hazard trees. Approval will be
	ТРО	If removed of quitable summer reacting babitet assure when bets are present on
	IR9	In removal of suitable summer roosting habitat occurs when bats are present on
		the landscape, a funding contribution (based on amount of nabitat removed)
		towards future conservation and recovery enors for rederally listed bats would
		be carried out. Project can consider seasonal bat presence/absence surveys
		(mist netting of emergence counts) that allow for positive detections without
		TVA to contribute to increased knowledge of bot procession on the landscore
		TVA to contribute to increased knowledge of bat presence on the landscape
		Projects that involve structural madification or demolition of buildings, bridges
	ART	and potentially quitable box guiverts, will require appearant to determine if
		and potentially suitable box cuiverts, will require assessment to determine in
		bet reast. If as a survey to determine if bets may be present will be conducted
		Structural accossmont will include:
		Visual check that include:
		building to look for ovidence of bate (o.g., bat droppings, react
		optrongo/ovit bolog): this can be done at any time of year, preferably
		when bets are active
		When bals are active.
		o where accessible and health and safety considerations allow, a survey of
		roor space for evidence of bals (e.g., droppings, scratch marks, staining,
		signings), noting relevant characteristics of internal reatures that provide
		potential access points and roosting opportunities. Suitable characteristic
		may include: gaps between tiles and roof lining, access points via eaves,
		gaps between timbers or around mortise joints, gaps around top and
		gable end walls, gaps within root walling or around tops of chimney
		preasts, and clean ridge beams.
		<ul> <li>Features with high-medium likelihood of harboring bats but cannot be</li> </ul>
		checked visually include soffits, cavity walls, space between roof covering
		and roof lining.
		• Applies to box culverts that are at least 5 feet (1.5 meters) tall and with
		one or more of the following characteristics. Suitable culverts for bat day
		roosts have the following characteristics:
		<ul> <li>Location in relatively warm areas</li> </ul>
L		

		<ul> <li>Between 5-10 feet (1.5-3 meters) tall and 300 ft (100 m) or more long</li> </ul>
		<ul> <li>Openings protected from high winds</li> </ul>
		<ul> <li>Not susceptible to flooding</li> </ul>
		Inner areas relatively dark with roughened walls or ceilings
		<ul> <li>Crevices imperfections or swallow nests</li> </ul>
		Bridge survey protocols will be adapted from the Programmatic Biological
		Opinion for the Federal Highway Administration (Appendix D of USFWS 2016c, which includes a Bridge Structure Assessment Guidance and a Bridge Structure Assessment Form).
		<ul> <li>Bat surveys usually are NOT needed in the following circumstances:</li> <li>Domestic garages /sheds with no enclosed roof space (with no ceiling)</li> </ul>
		<ul> <li>Modern flat-roofed buildings</li> </ul>
		Metal framed and roofed buildings
		<ul> <li>Buildings where roof space is regularly used (e.g., attic space converted to living space, living space open to rafters) or where all roof space is lit from skylights or windows. Large/tall roof spaces may be dark enough at apex to provide roost space.</li> </ul>
	AR2	Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present).
	AR3	Bridge survey protocols will be implemented, either by permittee (e.g., state DOT biologists) or qualified personnel. If a bridge is determined to be in use as an unconventional roost, subsequent protocols will be implemented.
	AR4	Removal of buildings with suitable roost characteristics within six miles of known
		or presumed occupied roosts for Virginia big-eared bat would occur between
		Nov 16 and Mar 31. Buildings may be removed other times of the year once a
		bat biologist evaluates a buildings' potential to serve as roosting habitat and
		determines that this species is not present and/or is not using structure(s).
		out or recommend (i.e., to applicants) seasonal modification or removal, TVA will carry out or recommend (i.e., to applicants) seasonal modification or removal. Risk to human safety, however, should take priority. For project-specific cases in which project is unable to accommodate seasonal modification or removal, and federally listed bat species are present, TVA will carry out or recommend consultation with the USFWS to determine the best approach in the context of the project-specific circumstance. This may include establishment of artificial roosts before demolition of structures with bats present.
-	SSPC1	Transmission actions and activities will continue to Implement A Guide for
		Environmental Protection and Best Management Practices for Tennessee Valley
		Authority Construction and Maintenance Activities. This focuses on control of
		sediment and pollutants, including herbicides. Following are key measures:
		<ul> <li>BMPs to minimize erosion and prevent/control water pollution in</li> </ul>
		accordance with state-specific construction storm water permits. BMPS
		are designed to keep soil in place and aid in reducing risk of other
		pollutants reaching surface waters, wetlands and ground water, BMPs
		will undertake the following principles:
		<ul> <li>Plan clearing, grading, and construction to minimize area and</li> </ul>
		duration of soil exposure.
		<ul> <li>Maintain existing vegetation wherever and whenever possible.</li> </ul>
		<ul> <li>Minimize disturbance of natural contours and drains.</li> </ul>
		<ul> <li>As much as practicable, operate on drv soils when they are least</li> </ul>
		susceptible to structural damage and erosion.
		<ul> <li>Limit vehicular and equipment traffic in disturbed areas.</li> </ul>
		<ul> <li>Keep equipment paths dispersed or designate single traffic flow</li> </ul>

	paths with appropriate road BMPs to manage runoff.
	<ul> <li>Divert runoff away from disturbed areas.</li> </ul>
	<ul> <li>Provide for dispersal of surface flow that carries sediment into</li> </ul>
	undisturbed surface zones with high infiltration capacity and
	around cover conditions.
	<ul> <li>Prepare drainage ways and outlets to handle</li> </ul>
	concentrated/increased runoff
	<ul> <li>Minimize length and steepness of slopes. Interrupt long slopes</li> </ul>
	frequently
	Tequentity.
	<ul> <li>Reep runoil velocilles low and/or check llows.</li> </ul>
	<ul> <li>Trap sediment on-site.</li> </ul>
	<ul> <li>Inspect/maintain control measures regularly and after significant rain.</li> </ul>
	<ul> <li>Re-vegetate and mulch disturbed areas as soon as practical</li> </ul>
	<ul> <li>Application of herbicide is in compliance with LISEPA state water quality.</li> </ul>
	standards, and state permits. Areas in which covered species are known
	to occur on existing transmission line POW are depicted on referenced
	condicable encodebasts and include guidelines to follow for impact
	applicable spreadsheets and include guidelines to follow for impact
	minimization or avoidance. During pre-job briefings, the ROW Forester
	will review location of resources with contractors and provide guidelines
	and expectations from TVA's BMP Manual (Appendix O). Herbicides
	labeled for aquatic use are utilized in and around wetlands, streams, and
	SMZs. Unless specifically labeled for aquatic use, measures are taken to
	keep herbicides from reaching streams whether by direct application or
	through runoff or flooding by surface water. Hand application of certain
	herbicides labeled for use within SMZs is used only selectively.
	<ul> <li>Specific guidelines regarding sensitive resources and buffer zones:</li> </ul>
	<ul> <li>Extra precaution (wider buffers) within SMZs is taken to protect</li> </ul>
	stream banks and water quality for streams, springs, sinkholes,
	and surrounding habitat.
	<ul> <li>BMPs are implemented to protect and enhance wetlands. Select</li> </ul>
	use of equipment and seasonal clearing is conducted when
	needed for rare plants; construction activities are restricted in
	areas with identified rare plants.
	<ul> <li>Standard requirements exist to avoid adverse impacts to caves,</li> </ul>
	protected animals, and unique and important habitat (e.g.,
	protective buffers around caves, restricted herbicide use.
	seasonal clearing of suitable habitat).
 SSPC2	Operations involving chemical/fuel storage or resupply and vehicle servicing will
	be handled outside of riparian zones (streamside management zones) in a
	manner to prevent these items from reaching a watercourse. Earthen berms or
	other effective means are installed to protect stream channel from direct surface
	runoff. Servicing will be done with care to avoid leakage, spillage, and
	subsequent stream, wetland, or ground water contamination. Oil waste, filters,
	other litter will be collected and disposed of properly. Equipment servicing and
	chemical/luei storage will be ilmited to locations greater than 300-It from
	karst features
 SSPC3	Power Plant actions and activities will continue to implement standard
	environmental practices. These include:
	<ul> <li>Best Management Practices (BMPs) in accordance with regulations:</li> </ul>

		<ul> <li>Ensure proper disposal of waste, ex: used rags, used oil, empty</li> </ul>
		containers, general trash, dependent on plant policy
		<ul> <li>Maintain every site with well-equipped spill response kits, included</li> </ul>
		in some heavy equipment
		<ul> <li>Conduct Quarterly Internal Environmental Field Assessments at</li> </ul>
		each sight
		<ul> <li>Every project must have an approved work package that contains</li> </ul>
		an environmental checklist that is approved by sight
		Environmental Health & Safety consultant.
		<ul> <li>When refueling, vehicle is positioned as close to pump as</li> </ul>
		possible to prevent drips, and overfilling of tank. Hose and nozzle
		are held in a vertical position to prevent spillage
		<ul> <li>Construction Site Protection Methods</li> </ul>
		<ul> <li>Sediment basin for runoff - used to trap sediments and</li> </ul>
		temporarily detain runoff on larger construction sites
		<ul> <li>Storm drain protection device</li> </ul>
		<ul> <li>Check dam to help slow down silt flow</li> </ul>
		<ul> <li>Silt fencing to reduce sediment movement</li> </ul>
		<ul> <li>Storm Water Pollution Prevention (SWPP) Pollution Control Strategies</li> </ul>
		<ul> <li>Minimize storm water contact with disturbed soils at the</li> </ul>
		construction site
		<ul> <li>Protect disturbed soil areas from erosion</li> </ul>
		<ul> <li>Minimize sediment in storm water before discharge</li> </ul>
		<ul> <li>Prevent storm water contact with other pollutants</li> </ul>
		<ul> <li>Construction sites also may be required to have a storm water</li> </ul>
		permit, depending on size of land disturbance ( >1 acre )
		<ul> <li>Every site has a Spill Prevention and Control Countermeasures (SPCC)</li> </ul>
		Plan and requires training. Several hundred pieces of equipment often
		managed at the same time on power generation properties. Goal is to
	<u> </u>	minimize fuel and chemical use
SSP	PC4	Woody vegetation burn piles associated with transmission construction will be
		placed in the center of newly established ROWs to minimize wash into any
		nearby undocumented caves that might be on adjacent private property and thus
		outside the scope of field survey for confirmation. Brush piles will be burned a
		minimum of 0.25 miles from documented caves and otherwise in the center of
		newly established ROW when proximity to caves on private land is unknown.
335	-05	development projects or land use projects include standards and conditions
		that include standard BMPs for sediment and contaminants as well as measures
		to avoid or minimize impacts to sensitive species or other resources consistent
		with applicable laws and Executive Orders
SSP	PC6	Herbicide use will be avoided within 200 ft of portals associated with caves, cave
	•••	collapse areas, mines and sinkholes that are capable of supporting cave-
		associated species. Herbicides are not applied to surface water or wetlands
		unless specifically labeled for aquatic use. Filter and buffer strips will conform at
		least to federal and state regulations and any label requirements.
SSP	°C7	Clearing of vegetation within a 200-ft radius of documented caves will be limited
		to that conducted by hand or small machinery clearing only (e.g., chainsaws,
		bush-hog, mowers). This will protect potential recharge areas of cave streams
		and other karst features that are connected hydrologically to caves.
L1		Direct temporary lighting away from suitable habitat during the active season.
L2		Evaluate the use of outdoor lighting during the active season and seek to
		minimize light pollution when installing new or replacing existing permanent
		lights by angling lights downward or via other light minimization measures (e.g.,
		aimming, directed lighting, motion-sensitive lighting).

<sup>1</sup>Bats addressed in consultation (02/2018), which includes gray bat (listed in 1976), Indiana bat (listed in 1967), northern long-eared bat (listed in 2015), and Virginia big-eared bat (listed in 1979).

Appendix D – Coordination



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

Received 4/15/16

April 11, 2016

Mr. Clinton Jones Tennessee Valley Authority 400 West Summit Hill Drive Knoxville, Tennessee 37902

### RE: TVA, CULTURAL RESOURCES ASSESSMENT, GALLATIN FOSSIL PLANT BORROW AREA, UNINCORPORATED, SUMNER COUNTY, TN

Dear Mr. Jones:

At your request, our office has reviewed the above-referenced archaeological survey report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we concur that the project area contains no historic properties eligible for listing in the National Register of Historic Places.

If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

Patrick MEhrtyre, Jr

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

EPM/jmb



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

May 8, 2018

Mr. E. Patrick McIntyre, Jr. Executive Director Tennessee Historical Commission 2941 Lebanon Road Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), GALLATIN FOSSIL PLANT (GAF), BORROW SITE, SUMNER COUNTY, TENNESSEE 36° 21' 1" N, 86° 25' 6" W

TVA proposes to develop a new borrow site at GAF in Sumner County, Tennessee. The borrow site would be used in multiple operations throughout the GAF reservation that require fill dirt. The borrow site area is located north of the GAF reservation, south of Gallatin, Tennessee, and west of Steam Plant Road (Figure 1). TVA has determined that this proposed borrow site development at GAF constitutes an undertaking (as defined at 36 CFR § 800.16(y)) of the type that has potential to cause effects on historic properties. We are initiating consultation with your office regarding this undertaking under Section 106 of the National Historic Preservation Act.

TVA determined that the area of potential effects (APE) for direct effects on historic properties includes the proposed borrow site and a ca. 70-meter (270 foot) wide corridor centered on Steam Plant Road that would be used for ingress/egress and laydown areas. The APE encompasses a total of approximately 251 acres. No buildings or other above-ground structures would be constructed, modified or removed as part of the project. Given the nature of the project, TVA considers the undertaking not to be of a type with potential for indirect effects on aboveground historic properties.

The APE is within a 223-acre property that TVA recently purchased in connection with the current undertaking. We initiated consultation with your office concerning the property purchase in April 2016. Based on a Phase I survey of the land proposed for acquisition and our consultation with your office and federally-recognized Indian tribes, TVA found that no historic properties were located within the property. Figure 2 shows the acquired property, the proposed limits of disturbance for the soil borrow project, and the 2016 survey area. TVA purchased this property in 2017.

An area of approximately 27.7 acres within the APE was not included in the 2016 survey because it was not part of the project design at that time. TVA retained Amec Foster Wheeler,

Mr. E. Patrick McIntyre, Jr. Page 2 May 8, 2018

Inc. to perform a Phase I Archaeological survey of this remaining portion of the APE. Enclosed are two bound copies of the draft report, titled, *Phase I Archaeological Survey, Gallatin Fossil Plant, Borrow Site Development Project, Sumner County, Tennessee*, along with an electronic copy on CD.

Background research completed prior to the survey indicated that no archaeological sites have been recorded previously in this part of the APE. The survey identified two previously unrecorded historic archaeological sites, 40SU341 and 40SU342. Site SU341 is associated with the early twentieth-century Walnut Grove Schoolhouse. Site 40SU342 is an early nineteenth- to twentieth-century site with an artifact scatter and pier stones. This site is near the location of an early twentieth-century farm structure and is potentially associated with a pre-1860 log structure. Based on the survey results TVA has determined both sites are potentially eligible for inclusion in the NRHP. The 2016 archaeological survey identified one historic cemetery (Vinson) within the APE. Although the Vinson Cemetery is not eligible for the NRHP, TVA considers it to be a cultural resource that is worthy of preservation.

Effects to these resources could include direct effects resulting from ground disturbing activities, or cumulative effects that would occur later due to erosion resulting from vegetation clearing or soil borrow activities. TVA proposes to avoid effects on both archaeological sites. Although the Vinson Cemetery is ineligible for inclusion in the NRHP, TVA will take steps to avoid or minimize potential project effects on this resource as well. TVA will place the following conditions on the work to avoid adverse project effects to all three resources:

- Locations of the Vinson Cemetery, 40SU341 and 40SU342 will be marked as "Sensitive Areas" on all project-related drawings.
- Construction fencing will be placed around these three resources prior to the start of vegetation clearing, and will remain in place during all construction activities. The fencing will include a 30-meter buffer surrounding the two site boundaries as defined in the survey, and a 30-meter buffer surrounding the cemetery.
- No mechanized equipment and no ground disturbing activities will be allowed within the boundaries of the three resources. Any vegetation removal within the boundaries would be performed by hand using hand tools, and cut vegetation would be removed from the site boundaries by hand or with the use of light-duty equipment such as an all-terrain vehicle.

TVA finds that, with these conditions on the work in the APE, the undertaking would result in no adverse effects on historic properties.

Pursuant to 36 CFR Sections 800.5(b), we are seeking your comments on TVA's finding of no adverse effect for the undertaking given the above modifications to the undertaking.

Pursuant to §800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the APE that may be of religious and cultural significance to the tribes.

Mr. E. Patrick McIntyre, Jr. Page 3 May 8, 2018

Should you have any questions or comments, please contact Steve Cole in Knoxville by email, sccole0@tva.gov or by phone, (865) 632-2551.

Sincerely,

Clinton E. Jones Manager Cultural Compliance

SCC:ABM Enclosures cc (Enclosures): Ms. Jennifer Barnett Tennessee Division of Archaeology 1216 Foster Avenue, Cole Bldg. #3 Nashville, Tennessee 37210 INTERNAL COPIES ONLY, NOT TO BE INCLUDED WITH OUTGOING LETTER:

A. Michelle Cagley, KFP 1T-KST Ashley R. Farless, BR 4A-C Marty M. Gamble, WT 11C-K Susan R. Jacks, WT 11C-K M. Susan Smelley, BR 4A-C Edward W. Wells, WT 11D-K ECM, WT CA-K



Figure 1. Proposed borrow area at Gallatin Fossil Plant.



Figure 2. Land recently acquired by TVA for borrow site development, proposed limits of disturbance, and 2016 survey area.



# PHASE I ARCHAEOLOGICAL SURVEY Gallatin Fossil Plant, Borrow Site Development Project, Sumner County, Tennessee



# April 2018

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

May 14, 2018

Mr. Clinton E. Jones Tennessee Valley Authority Biological and Cultural Compliance 400 West Summit Hill Drive Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Gallatin Fossil Plant Borrow Site, 27.7 Acres, Gallatin, Sumner County, TN

Dear Mr. Jones:

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

Considering the information provided, we concur that no historic properties eligible for listing in the National Register of Historic Places will be affected by this undertaking. If project plans are changed or archaeological remains are discovered during project construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. Questions or comments may be directed to Jennifer Barnett (615) 687-4780.

Your cooperation is appreciated.

Sincerely,

E Patrick ME Intyre, Jr.

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

EPM/jmb

# Boulware, Karen

From:	Ezzell, Patricia Bernard <pbezzell@tva.gov></pbezzell@tva.gov>
Sent:	Tuesday, May 08, 2018 6:30 PM
То:	Cole, Steve C; Wells, Edward William III; McCampbell, Amy Boardman; Shuler, Marianne M
Subject:	FW: TVA, Gallatin Fossil Plant, Borrow Site, Sumner County, Tennessee

### Comments from Shawnee Tribe

From: tonya@shawnee-tribe.com [mailto:tonya@shawnee-tribe.com]
Sent: Tuesday, May 08, 2018 5:19 PM
To: Ezzell, Patricia Bernard
Subject: RE: TVA, Gallatin Fossil Plant, Borrow Site, Sumner County, Tennessee

#### TVA External Message. Please use caution when opening.

This letter is in response to the above referenced project.

The Shawnee Tribe's Tribal Historic Preservation Department concurs that no known historic properties will be negatively impacted by this project.

We have no issues or concerns at this time, but in the event that archaeological materials are encountered during construction, use, or maintenance of this location, please re-notify us at that time as we would like to resume immediate consultation under such a circumstance.

If you have any questions, you may contact me via email at tonya@shawnee-tribe.com

Thank you for giving us the opportunity to comment on this project.

Sincerely, Tonya Tipton Shawnee Tribe



From: Ezzell, Patricia Bernard <pbezzell@tva.gov>

Sent: Tuesday, May 8, 2018 2:50 PM

**To:** 'ethompson@astribe.com' <ethompson@astribe.com>; elizabeth-toombs@cherokee.org; HPO@chickasaw.net; hollymaustin94@gmail.com; BBarnes@estoo.net; dc13.dc4@gmail.com; 'section106@mcn-nsn.gov' <section106@mcn-nsn.gov>; Tonya Tipton (tonya@shawnee-tribe.com) <tonya@shawnee-tribe.com>; 'THPO' <thpo@tttown.org>; Sheila Bird (sbird@ukb-nsn.gov) <sbird@ukb-nsn.gov>

**Cc:** Stephen Yerka <syerka@nc-cherokee.com> (syerka@nc-cherokee.com) <syerka@nc-cherokee.com>; 'Russell Townsend' <RussellT@nc-cherokee.com>; David.Cook@kialegeetribe.net; Karen Pritchett <kpritchett@ukb-nsn.gov>; Rachel Perash (RPerash@ukb-nsn.gov) <RPerash@ukb-nsn.gov>

Subject: TVA, Gallatin Fossil Plant, Borrow Site, Sumner County, Tennessee

### Good Afternoon,

I hope this email message finds you well. By this email, I am transmitting the attached letter regarding TVA's proposal to develop a new borrow site at GAF in Sumner County, Tennessee.

The referenced report is attached.

Please let me know if you have any questions, and please provide any comments on the proposed undertaking no later than June 7, 2018.

Thank you.

Sincerely,

Pat

### Pat Bernard Ezzell

Senior Program Manager and Federal Preservation Officer Community Relations

Tennessee Valley Authority 400 W. Summit Hill Drive Knoxville, TN 37902

(865) 632-6461 (w) (865) 806-0370 (m) <u>pbezzell@tva.gov</u>



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