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POTENTIAL BULL RUN FOSSIL PLANT RETIREMENT FINAL ENVIRONMENTAL ASSESSMENT

Anderson County, Tennessee

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Symbols, Acronyms, and Abbreviations

°F	Fahrenheit
µg	microgram
AADT	Annual Average Daily Traffic
ACS	American Community Survey
BIP	Balanced Indigenous Population
BMP	best management practice
BRF	Bull Run Fossil Plant
CCR	Coal Combustion Residuals
CCR Rule	USEPA Final Rule on Disposal of Coal Combustion Residuals from Electric Utilities
CCW	condenser cooling water
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CO	carbon monoxide
CO_2	carbon dioxide
CRM	Clinch River Mile
cy	cubic yards
dB	decibels
dBA	A-weighted decibels
DNL	day-night average sound level
EA	Environmental Assessment
EIP	Environmental Investigation Plan
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right to Know Act
EPT	*Ephemeroptera*, *Plecoptera*, and *Trichoptera*
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FGD	flue gas desulfurization
FHWA	Federal Highway Administration
FY	fiscal year
GHG	greenhouse gas
HPA	Habitat Protection Area
I-	Interstate
IRP	Integrated Resource Plan
L	liter
lb	pound
m^3	cubic meter
MCL	maximum contaminant level
mg	milligram
MGD	million gallons per day
MWh	megawatt hour
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGCC	natural gas-fired combined-cycle
NO_2	nitrogen dioxide
NO_x	nitrogen oxides

NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NWS	National Weather Service
O_3	Ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyls
pH	potential hydrogen
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
ppb	parts per billion
PSA	power service area
RCRA	Resource Conservation and Recovery Act
RBI	Reservoir Benthic Macroinvertebrate Index
RFAI	Reservoir Fish Assemblage Index
RFFA	reasonably foreseeable future actions
SAIPE	Small Area Income and Poverty Estimates
SEA	Supplemental Environmental Assessment
SO_2	sulfur dioxide
SPL	sound pressure level
SR	State Route
T.C.A.	Tennessee Code Annotated
TDEC	Tennessee Department of Environment and Conservation
TPO	Knoxville Regional Transportation Planning Organization
TSCA	Toxic Substances Control Act
TSS	total suspended solids
TVA	Tennessee Valley Authority
U.S.	United States
USBLS	United States Bureau of Labor Statistics
USC	United States Code
USCB	United States Census Bureau
USEIA	United States Energy Information Administration
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile organic compound

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Introduction

The Bull Run Fossil Plant (BRF) is located in Anderson County, Tennessee, about 5 miles east of downtown Oak Ridge and 13 miles west of Knoxville (**Figure 1-1**). BRF is operated by the Tennessee Valley Authority (TVA) and is located on a 750-acre reservation on the east side of Melton Hill Reservoir at Clinch River Mile (CRM) 48. The plant adjoins Edgemoor Road (State Route [SR] 170) between United States (U.S.) Highway 25 (Clinton Highway) and SR 162 (Pellissippi Parkway). Most surrounding lands are residential subdivisions, rural residential areas, and forested parklands.

BRF was built between 1962 and 1966, and commercial operation began in June 1967. BRF has a single boiler and generator with a summer net capability of 863 megawatts; at the time it was built, it was the largest in the world in the volume of steam produced. Winter net-dependable generating capacity is about 881 megawatts. BRF generates over 6 billion kilowatt-hours of electric power in a typical year, which is enough electrical energy to meet the needs of approximately 430,000 homes.

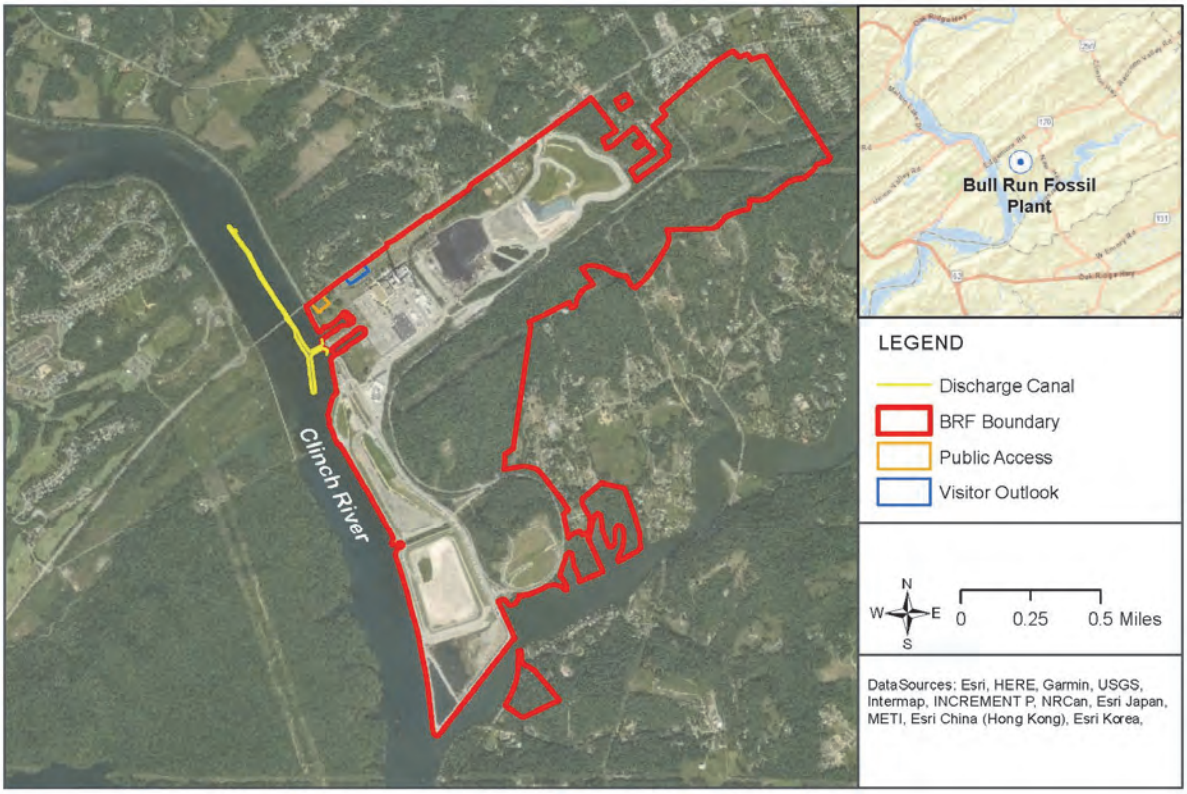

Figure 1-1. Bull Run Fossil Plant Overview Map

In August 2015, TVA published the 2015 Integrated Resource Plan (IRP; TVA 2015a) and associated environmental impact statement (EIS) which was developed with input from stakeholder groups and the general public. The 2015 IRP evaluated five scenarios (plausible futures) and five strategies (potential TVA responses to those futures) and identified a range of potential resource additions and retirements throughout the TVA power service area (PSA), which encompasses approximately 80,000 square miles for the

majority of Tennessee and parts of Alabama, Georgia, Kentucky, Mississippi, North Carolina and Virginia. The target supply mix adopted by the TVA Board through the 2015 IRP recommended the potential retirement of up to 2,600 MW of coal-fired generation by 2033.

TVA has experienced flat to declining load, most similar to the Distributed Marketplace scenario in the 2015 IRP, and natural gas prices have remained relatively low. These conditions have prompted TVA to conduct economic analyses of all its generating assets considering load outlook, economic benefits and costs, performance, and environmental and social impacts. Assets that have relatively high projected future maintenance costs and environmental compliance expenditures, a high forced outage (i.e., an unplanned shutdown to repair or replace failed equipment) rate, and poor generation portfolio fit have been the focus of more detailed study for potential retirement. BRF falls into this category of assets.

Due to the reasons stated above, TVA has prepared this environmental assessment (EA) pursuant to the National Environmental Policy Act (NEPA) and TVA's procedures for implementing NEPA to assess site-specific impacts of the potential retirement of BRF. TVA is also currently working with stakeholders to develop the 2019 IRP (TVA 2018f) and associated EIS, which include evaluation of future potential retirements as options across various planning scenarios and strategies, similar to the 2015 IRP. Comprehensive analysis, including the NEPA evaluation for retirement of BRF and the Draft 2019 IRP and associated EIS, will inform the TVA Board as TVA plans its future power supply.

1.2 Purpose and Need

TVA is assessing the continuing cost of operating BRF against the demand projections and TVA's statutory mission to provide reliable power at the lowest system cost. Certain costs that would be incurred at BRF in the next few years have created the need to undertake this assessment. BRF also has significant future capital needs to support compliance with the U.S. Environmental Protection Agency (USEPA) Effluent Limitation Guidelines rule. Moreover, BRF is experiencing deterioration in its material condition, resulting in reliability challenges and need for large investments. Material condition challenges have contributed to a forced outage rate that places BRF in the bottom quartile of the U.S. fleet and the worst in the TVA coal fleet for forced outage occurrences. Given lower loads, continued low natural gas prices, and the potential for greater load swings (i.e., large changes in demand over short time periods), TVA's resource portfolio benefits most from continued operation of two types of coal units:

- Large, efficient coal units with low operating costs and low forced outage rates to effectively serve baseload, and
- Small, flexible coal units with medium operating costs and low forced outage rates to effectively meet load swings.

Another factor to consider is the way BRF is being operated. The plant is designed to produce over 800 megawatts of steady power generation. However, with increased volatility in energy consumption and increased nuclear generation that provides lower cost, steady generation output, BRF is challenged to adjust in order to respond to these changes in consumption.

Recent improvements to increase flexibility have resulted in BRF being able to achieve lower emergency minimum generation output and improve the ability to cycle off and back on more reliably. Even with these improvements, however, BRF does not provide the level

of flexibility needed to balance hourly, daily and seasonal changes in energy consumption. In addition, cycling off and on results in more wear and tear and higher operation and maintenance costs.

As future consumer demand for renewable energy continues to rise, generation flexibility will become even more important. The addition of new solar generation will require even more flexibility than TVA units supply today. Weather changes, such as cloud movement that temporarily blocks the sun and reduces solar generation, cause other generating units to respond in order to continue to reliably supply power to the consumer. BRF is not designed to provide this type of response.

Additionally, it is beneficial for coal units to offer fuel flexibility, such as being able to utilize existing coal supplies from many different mines and/or geographic locations. As a large, inflexible coal unit with medium operating costs and a high forced outage rate, BRF does not fit current and likely future portfolio needs. The retirement of such a unit would facilitate TVA's statutory mission to provide reliable power at the lowest system cost.

TVA system planners performed an economic evaluation of the BRF retirement which takes into account fuel price volatility. Impacts of fuel price volatility were evaluated against high and low gas price sensitivities. The evaluation indicated that other TVA coal units can partly replace the generation currently provided by BRF, muting impacts during periods of higher natural gas prices. Additionally, TVA commissioned a fuel resiliency study conducted by a third party that evaluated TVA's fuel resiliency with and without the BRF retirement. The study criteria included fuel supply, fuel delivery, inventory, and backup contingencies for all of TVA's generating assets. It indicated that TVA's overall fuel supply position is among the most resilient in the U.S. due to a well-diversified generation portfolio, advantageous location with respect to major gas pipelines, access to multiple coal supply and transport options, and a strong and resilient program to secure nuclear fuel. An analysis of study findings indicates that reducing the coal fleet would not materially impact TVA's fuel resiliency. Therefore, TVA has prepared this EA to evaluate the potential retirement of BRF in 2023 considering load outlook, economic benefits and costs, performance, and environmental and social impacts, with no immediate need to replace the generating capacity currently provided by BRF. TVA's mission is to ensure a low cost, reliable, risk-informed, diverse, environmentally responsible, and flexible power system is provided to ratepayers.

1.3 Related Environmental Reviews

The following environmental reviews have been prepared for actions related to coal combustion residuals (fly ash, bottom ash and gypsum; CCR) management at BRF:

- *Bull Run Fossil Plant Landfill Final Environmental Impact Statement* (TVA 2016) The EIS was prepared to address alternatives for the future disposal of CCR produced at BRF. It describes the need for additional storage capacity for the long-term disposal of the dry CCR materials to enable TVA to continue operations at BRF beyond 2024. In its Record of Decision, TVA decided to construct and operate a new, 120-acre landfill a short distance east of BRF.
- *Ash Impoundment Closure Environmental Impact Statement* (TVA 2016b). This EIS, among other things, analyzed the potential impacts of closing two ash impoundments at BRF. The *Bull Run Fossil Plant Ash Impoundment Closure Project, Supplemental Environmental Assessment (SEA), October 2017* was

developed to expand the closure area discussed in the EIS and assess long-term wastewater treatment at BRF (TVA 2017). A second SEA, *Bull Run Fossil Plant Ash Impoundment Closure Project, Supplemental Environmental Assessment, August 2018*, was developed to assess an installation of a temporary cover on a portion of the Fly Ash Impoundment at BRF, which would eliminate wet CCR storage and provide a facility for stormwater and wastewater treatment (TVA 2018).

- *Integrated Resource Plan, 2015 Final Report and EIS* (TVA 2015a). This plan provides direction for how TVA will meet the long-term energy needs of the TVA PSA. This document and the associated EIS 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 equally important 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 and stated that the operational plan for BRF was continued operation.
- *Bull Run Fossil Plant House Demolition and Hydrogeologic Investigations Environmental Assessment* (TVA 2013). This EA analyzes the removal of unoccupied houses and other structures from a 166 acre tract of land that TVA purchased adjacent to BRF for the potential future use as a CCR landfill. It also addresses hydrogeologic investigations of the site to guide its potential future development.
- *Bottom Ash and Gypsum Mechanical Dewatering Facility Bull Run Fossil Plant, Final EA* (TVA 2012). This EA evaluated the installation of equipment to remove water from gypsum and bottom ash generated at BRF. The dewatering equipment allows TVA to convert its bottom ash and gypsum handling processes to a dry system.

1.4 Scope of the Environmental Assessment

This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If TVA decides to retire BRF, actions associated with deconstruction and demolition of BRF and the disposition of the plant site would be addressed in future NEPA reviews. A detailed description of the proposed action and alternatives considered are provided in Chapter 2. TVA has performed a preliminary analysis and determined that the following resources would not be affected by the proposed action and are eliminated from detailed review:

- Cultural Resources – No ground disturbing activities are anticipated or changes to the historical viewshed; therefore, potential effects were found to be absent and cultural resources do not require further evaluation.
- Potential effects related to land use, botany, wildlife, geology, floodplains, managed areas, prime farmland, and wetlands were considered. However, due to the nature of the action and project footprint, potential effects were found to be absent and these resources do not require further evaluation.

TVA determined that the environmental resources listed below could be affected by the proposed action; they are addressed in detail in this EA:

- Air Quality
- Surface Water
- Groundwater
- Aquatic Resources

- Threatened and Endangered Species
- Recreation
- Solid and Hazardous Waste
- Transportation
- Noise
- Socioeconomics and Environmental Justice

TVA's action would satisfy the requirements of Executive Order (EO) 12898 (Environmental Justice) and applicable laws including the National Historic Preservation Act, Endangered Species Act (ESA), Clean Water Act, and Clean Air Act.

1.5 Public and Agency Involvement

TVA issued a draft of this EA for a 30-day public and agency review. The availability of the draft EA was announced in two newspapers that serve the Anderson County area, *The Clinton Courier* and *The Oak Ridger*. The draft EA and a request for comments were also posted on the TVA website. Notice of the availability of the draft EA and request for comments were sent to local, state, and federal agencies. Chapter 5 provides a list of agencies and organizations notified of the availability of the draft EA. Comments were accepted from November 19, 2018 through December 19, 2018 via the TVA website, mail, and e-mail.

TVA received 39 comments on the draft EA. Commenters include the Tennessee Interfaith Power and Light, Southern Environmental Law Center, Sierra Club, a Tennessee state senator, Mayor of Anderson County, Mayor of Oak Ridge, federal and state agencies, and local and regional residents. Approximately half of the comments are in favor of the retirement of BRF to provide a cleaner environment and greater visual aesthetic for the area, reduce the costs of maintaining the plant and to provide for more renewable energy resources. Some commenters suggested updating the BRF plant to enable it to burn cleaner fuel and to make it more efficient and less expensive to maintain, including updating the boiler or converting to natural gas. Other commenters expressed concern about potential socioeconomic impacts of the retirement on the surrounding communities and supporting industries.

The Sierra Club submitted a form letter in support of the potential retirement of BRF and Paradise Fossil Plant (evaluated under a separate EA). The letter also stated that TVA should provide a just transition for TVA employees and the surrounding communities affected by the potential retirement of these facilities. The letter was signed by 613 Sierra Club members and contained messages from 274 Sierra Club members. Appendix A contains the compiled comments on the draft EA and TVA's responses to those comments. Appendix B contains the text of the comments received.

TVA's Board received comments from the public and agencies after the closure of the comment period on December 19, 2018. While these comments are not included in Appendix B, the general themes of these comments have been addressed in responses to the comments received during the comment period.

1.6 Necessary Permits or Licenses and Consultation Requirements

TVA would obtain necessary permits, licenses, and approvals required for the alternative selected. Depending on the alternative selected, TVA may need to obtain or seek amendments to the following permits:

- National Pollutant Discharge Elimination System (NPDES) permit No. TN0005410.
- Multi-Sector General Stormwater Permit's Storm Water Pollution Prevention Plan (SWPPP) Solid Waste Class II Disposal Permit from Tennessee Department of Environment and Conservation (TDEC).
- Title V Air Permit for air emissions.

Necessary permits would be evaluated based on site-specific conditions.

CHAPTER 2 - ALTERNATIVES

This chapter presents descriptions of the proposed action and its alternatives to address the retirement of BRF in 2023. **Table 2-1** provides an overview of which actions are associated with each alternative.

Table 2-1. Summary and Comparison of Projects by Alternatives

Activity	Alternative A: No Action Alternative	Alternative B: Potential Retirement of Bull Run Fossil Plant
Actions under Consideration in this EA		
Plant Decommissioning		X
Plant Deactivation		X
Plant Decontamination		X
Continued Operation of the Plant	X	
Projects Previously Evaluated		
New CCR Landfill	X	
Environmental Investigation Plan	X	X
Bottom Ash Complex Closure	X	X
Gypsum Impoundment Closure	X	X
Partial Fly Ash Impoundment Closure	X	X
Process Water Basins	X	X
Stilling Pond Closure		X
Foreseeable Future Projects not Evaluated in this EA		
Lateral Expansion of South Slope Drainage	X	X
Waste Water Treatment Facility	X	
Bottom Ash Overflow Optimization	X	
Underflow Piping	X	
Sulfite Analyzers	X	
Outage Wash Collection System	X	
Deconstruction and Demolition of the BRF		X

2.1 Description of Alternatives

2.1.1 Coal Combustion Residual Activities to Occur with All Alternatives

TVA has previously evaluated and decided to implement several actions related to the current and future management and storage of CCRs at BRF, both to implement its policy to convert its operations from wet to dry CCR management and to comply with USEPA's CCR Rule (USEPA 2018e). This section discusses actions related to CCR management that would occur if the plant remains operational (Alternative A) or is retired (Alternative B).

The implementation of many of the CCR activities is dependent on the outcome of the Environmental Investigation Plan (EIP) that TVA is currently developing. Per TDEC Consent Order No. OGC15-0177, TVA is developing the EIP for BRF to set forth a "process for the investigation, assessment, and remediation of unacceptable risks" at BRF coal ash disposal sites. This includes gathering existing CCR data, conducting sampling, developing analysis plans, and revising the EIP to address TDEC and public comments. Under either alternative, the following projects would start within the next 6 years; they have been previously analyzed in NEPA documents listed in **Section 1.3**.

1. **Bottom Ash Complex Final Closure.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require closure of the Bottom Ash Complex at BRF. Associated actions include dewatering impoundments, rerouting storm water and wastewater conveyances, grading and reconfiguring the stored bottom ash, transferring 250,000 cubic yards of borrow material to grade and cover the site, and installing protective covers (TVA 2016b).
2. **Gypsum Impoundment Final Closure.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require closure of the Gypsum Impoundment at BRF (TVA 2016b).
3. **Partial Fly Ash Impoundment Closure.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require repurposing of a portion of the Fly Ash Impoundment and Stilling Pond at BRF for use as a non-CCR Process Water Basin. Associated actions include temporarily covering 20 acres of the Fly Ash Impoundment, closing the remaining 13 acres, and repurposing the closed portion as a Process Water Basin for BRF. The Stilling Pond would be closed-by-removal and repurposed as a separate Process Water Basin. These basins would only manage storm water and non-CCR wastewater from BRF facilities (TVA 2017a; TVA 2018).
4. **Process Water Basins.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require closure of the Process Water Basins at BRF as described under the Partial Fly Ash Impoundment Closure (TVA 2017a; TVA 2018).

In addition, TVA would implement the lateral expansion of south slope drainage and a NEPA review of this project would be completed as additional details are available.

2.1.2 Alternative A – The No Action Alternative

Under the No Action Alternative, BRF would not be retired and would continue to be part of TVA's generation portfolio. Under this alternative, as well as under Alternative B, TVA would implement several actions related to CCR management described in Table 2-1 and Section 2.1.1. In order to continue operating BRF, TVA would construct a new CCR landfill over the next 6 years. This 120-acre landfill would be located about 0.4 miles east of BRF and would provide approximately 15 years of CCR disposal capacity. Associated actions

include the construction of a haul road, perimeter roads, and sediment ponds. The construction and operation of the new landfill, along with its potential environmental impacts, are described in detail in TVA 2016a.

TVA would also implement projects associated with the waste water treatment facility, bottom ash overflow optimization and underflow piping, sulfite analyzers, and outage wash collection system. Details regarding these projects, including analyses of their potential environmental impacts, have not been finalized. The projects discussed in this paragraph would not be completed if the decision is made to retire BRF. If a decision is made to continue operating BRF and additional details are available, the analyses of these projects would be completed.

2.1.3 Alternative B – Potential Retirement of Bull Run Fossil Plant

Under Alternative B, TVA would retire BRF in 2023. At that time, TVA would cease most plant operations and reduce plant staff. In order to minimize environmental and safety risks and comply with applicable laws and regulations, TVA would implement the actions described below.

2.1.3.1 Decommissioning, Deactivation, and Decontamination Activities

Decommissioning is the performance of activities required to ready a facility for deactivation. Work performed includes removal of equipment, components, and parts that can be used at other sites, draining of oil/fluids from equipment, removal of coal and ash from boilers and other equipment, removal of hazardous materials and potential waste-like materials, removal of polychlorinated biphenyls (PCBs) equipment, removal of furniture/furnishings, removal of information technology assets, and removal of plant records. Key activities include:

- Tagging out all unit or plant equipment except service water, lighting, etc.
- Emptying and cleaning hoppers, bins, bunkers, etc.
- Opening all equipment electrical breakers not in use
- Draining oil and fluids
- Salvaging and storing all useable equipment, components, materials, spare parts, office products etc. and relocating them, as practical
- Salvaging and storing all key plant records.

Deactivation is shutting down of power and energized systems as appropriate as well as isolating and/or severing power, water and piping to the plant to provide a cold, dark and dry structure. Work includes removing power and services, installing bulkheads, and sealing tunnels. Activities may also include rerouting of power and services as required for any facilities that would remain operational. Key activities include:

- Performing electrical and mechanical isolation of systems, components and areas
- Installing bulkheads and/or fill tunnels
- Providing alternate power and services (sump pumps, Federal Aviation Administration (FAA) stack lighting, etc.)

Limited decontamination involves removing select regulated materials in a safe and practical manner in such a way that the plant is left in a status that does not present a hazard or risk to the environment or personnel. Limited decontamination activities at BRF includes abatement and disposal of regulated materials, which include but are not limited to PCB equipment, asbestos, hazardous waste, and solid waste. Key activities include:

- Removal and proper disposal of regulated materials as practical

- Periodic materials condition monitoring.
- Periodic waste removal as materials deteriorate over time.

2.1.3.2 CCR Activities

Under Alternative B, TVA would implement several CCR-related actions listed in Table 2-1 and described in Section 2.1.1. With the cessation of CCR production in 2023, the new CCR landfill and associated facilities that would otherwise be constructed a short distance east of the plant would not be necessary. However, if the implementation of the TDEC Consent Order results in the need for TVA to close its existing CCR impoundments at BRF by removal, then the landfill and associated facilities may still need to be constructed.

2.2 Comparison of Alternatives

Table 2-2 provides a comparison of alternatives with respect to environmental consequences.

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

Resource Area	Impacts[1] From Alternative A: No Action Alternative[2]	Impacts From Alternative B: Potential Retirement of Bull Run Fossil Plant
Air quality	Minor	Long-term, minor, beneficial impacts from reductions in TVA's system-wide emissions of SO_2, NO_x, mercury and CO_2.
Surface Water	No impacts	Temporary, negligible impacts; Long-term direct, indirect, and cumulative beneficial impacts.
Groundwater	No impacts	Long-term, minor, beneficial impacts
Aquatic Ecology	Direct, minor impacts on the Clinch River. Direct and minor beneficial impacts on the Melton Hill Reservoir fishery.	Long-term, negligible beneficial impacts on the Clinch River. Long-term, direct, negligible adverse impacts on communities downstream of BRF. Long-term, direct, minor, impacts on Melton Hill Reservoir fishery.
Threatened and Endangered Species	No effect on listed species.	No effect on listed species.
Solid and Hazardous Waste	No impacts	Long-term, negligible beneficial impacts
Visual resources	No impacts	Beneficial impacts
Recreation	No impacts	Long-term, minor
Transportation	No impacts	Short-term, minor impacts. Long-term, minor beneficial impacts.
Noise	No impacts	Short-term, minor impacts. Long-term, minor beneficial impacts.
Socioeconomics	No impacts	No significant environmental justice impacts. Minor, direct and indirect impacts on socioeconomics.
Cumulative	Minor cumulative impacts	Minor cumulative impacts

[1] Unless otherwise stated, impacts listed in the table are adverse effects.

[2] Impacts under the No Action Alterative are described based on continued operations. Actions related to the current and future management and storage of CCRs at BRF have been previously reviewed or will be reviewed in the future. Table 2-2 does not include impacts associated with CCR management projects.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing conditions of environmental resources in the project area and the anticipated environmental consequences that would occur from adoption of the alternatives described in Chapter 2. The affected environment descriptions below are based on surveys conducted by TVA and contractors, published and unpublished reports, and personal communications with resource experts. This chapter only considers the environmental consequences associated with the continued operation of BRF (Alternative A) or the potential retirement of BRF (Alternative B). Environmental consequences associated with CCR management activities have been previously reviewed under NEPA, or will be reviewed in the future. Therefore, the CCR management projects are not further evaluated here.

3.1 Air Quality

3.1.1 Affected Environment

This section describes the existing air quality and climate conditions in the study area and the potential air quality impacts of the proposed project. The study area for air quality is defined as Anderson County, Tennessee. However, given that air emissions obviously cross county lines, the assessment here can be considered to apply to air quality effects over larger areas downwind of the facility. For purposes of climate assessment, the study area is Anderson County with respect to local climate conditions, and with respect to greenhouse gas (GHG) emissions, the study area is the global environment.

3.1.1.1 Air Quality

Air quality is measured primarily by the concentrations of six criteria pollutants within a region. The criteria pollutants are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), sulfur dioxide (SO_2), and particulate matter (PM), which includes two subcategories: particles less than 10 microns in diameter (PM_{10}) and particles less than 2.5 microns in diameter ($PM_{2.5}$). Criteria air pollutants are subject to National Ambient Air Quality Standards (NAAQS) that were developed by the USEPA Office of Air Quality Planning and Standards, and were chosen because they are the predominant air pollutants of concern for the environment and public health. The NAAQS are summarized in **Table 3-1**.

USEPA designates compliance status for the NAAQS through a formal rulemaking process involving publication of proposed and final rules in the *Federal Register*. For each pollutant for which there is a NAAQS, USEPA designates an area as attainment, nonattainment, or maintenance. A maintenance area, sometimes referred to as maintenance/attainment, is one that was designated as nonattainment within the prior 20 years, and has come into attainment with the NAAQS. Part of the redesignation process requires that the state or local agency with responsibility for managing air quality in the area must submit for USEPA approval a plan to maintain compliance with the NAAQS for which the area was in nonattainment status.

Anderson County is an attainment or maintenance area for all criteria pollutants (USEPA 2018a). However, all or part of the County has been in nonattainment status for two pollutants in the past 20 years. On September 27, 2017, Anderson County was redesignated by the USEPA from a nonattainment to a maintenance area for the 2006

NAAQS for $PM_{2.5}$. On August 12, 2015, parts of Anderson County were redesignated from nonattainment to maintenance for the 8-hour 2008 ozone standard. The parts of Anderson County that achieved maintenance status for the 8-hour 2008 ozone standard include U.S. Census Bureau Tract 213.02, in which BRF is located, and Tract 202 of the 2000 Census. Air quality has continued to improve in the area, such that USEPA designated Anderson County and the whole state of Tennessee as in attainment for the more stringent 2015 ozone NAAQS.

Table 3-1. National Ambient Air Quality Standards

POLLUTANT	AVERAGING TIMES	PRIMARY NAAQS	SECONDARY NAAQS
CO	8-hour[a]	9 ppm (10 mg/m^3)	None
	1-hour [a]	35 ppm (40 mg/m^3)	None
Pb	Rolling 3-Month Average	0.15 µg/m^3	Same as Primary
NO_2	Annual (Arithmetic Mean)	0.053 ppm (100 µg/m^3)	Same as Primary
	1-hour [f]	0.100 ppm (188 ug/m^3)	Same as Primary
PM_{10}	24-hour [b]	150 µg/m^3	Same as Primary
$PM_{2.5}$	Annual [c] (Arithmetic Mean)	12.0 µg/m^3	Same as Primary
	24-hour [d]	35 µg/m^3	Same as Primary
O_3	8-hour [e]	0.075 ppm (2008 std.)	Same as Primary
	8-hour [e]	0.070 ppm (2015 std.)	Same as Primary
SO_2	3-hour [a]	none	0.5 ppm (1300 µg/m^3)
	1-hour [g]	0.075 ppm (196 ug/m^3)	Same as Primary

Source: 40 CFR part 50

Notes:

[a] Not to be exceeded more than once per year.

[b] Not to be exceeded more than once per year on average over 3 years.

[c] To attain this standard, the 3-year average at any monitor must not exceed 12.0 µg/m^3.

[d] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3.

[e] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed the standard. While both the 2008 and 2015 standards are still in place, the 2015 standard is the controlling one, given its greater stringency.

[f] Standard is attained when the 3-year average of the eighth-highest daily maximum 1-hour average NO_2 concentration does not exceed 0.100 ppm (100 ppb)

[g] Standard is attained when the 3-year average of the fourth-highest daily maximum 1-hour average NO_2 concentration does not exceed 0.100 ppm (100 ppb).

Summarized in **Table 3-2** are monitoring data for $PM_{2.5}$ and ozone (USEPA 2018b), which due to the current maintenance status, are the pollutants of greatest interest in the air quality study area. Also, these are the only two pollutants with available monitoring data for recent years within 10 miles of BRF. The $PM_{2.5}$ monitor is located at Bearden Middle School, 1000 Francis Road, Knoxville, which is approximately 8 miles southeast of the power plant. The ozone monitor is located at the Freels Bend study area, on the north side of Melton Hill Reservoir within the Oak Ridge Reservation, approximately 5 miles southwest of the plant. The monitor locations relative to BRF are shown in **Figure 3-1**. The ambient monitor data indicate compliance with the NAAQS based on three-year averages, which is the basis for USEPA attainment/nonattainment designations.

Figure 3-1. Ambient Air Monitor Locations in Vicinity of Bull Run Fossil Plant

Table 3-2. Monitored Air Quality in Vicinity of Bull Run Fossil Plant

Pollutant	Averaging Period	Units	Monitored Design Concentrations [a] 2013	2014	2015	2016	2017	NAAQS
$PM_{2.5}$	24-hour	µg/m^3	19.1	18.7	19.2	21.5	17.4	35
	Annual	µg/m^3	9.4	9.6	8.8	9.5	8.2	12
Ozone	8-hour	ppm	0.060	0.060	0.065	0.066	0.063	0.070

[a] The design concentration is the monitored (ranked or percentile basis) concentration that would be used to assess compliance with the NAAQS.

3.1.1.2 Climate

The climate of Anderson County is typical of much of the southern Appalachian area, which experiences generally warm, humid summers and temperate winters with occasional accumulations of snow or ice. Based on data from the Knoxville Airport, Tyson Field (NWS 2018), the annual average precipitation is approximately 48 inches and average annual snowfall is 9.3 inches. The all-time high temperature for Knoxville was 105 degrees Fahrenheit (°F) and the all-time low temperature was -24°F.

The average (mean) temperatures at Knoxville (Tyson Field) for January, July, and the annual period are shown in **Figure 3-2** (Iowa State University 2018). Average annual temperature is approximately 59°F with essentially no trend up or down over the period of record. The July monthly temperature average is approximately 78°F, again with little trend over the period of record. The January monthly temperature average is approximately 40°F, with a downward trend of around 3°F over the period of record.

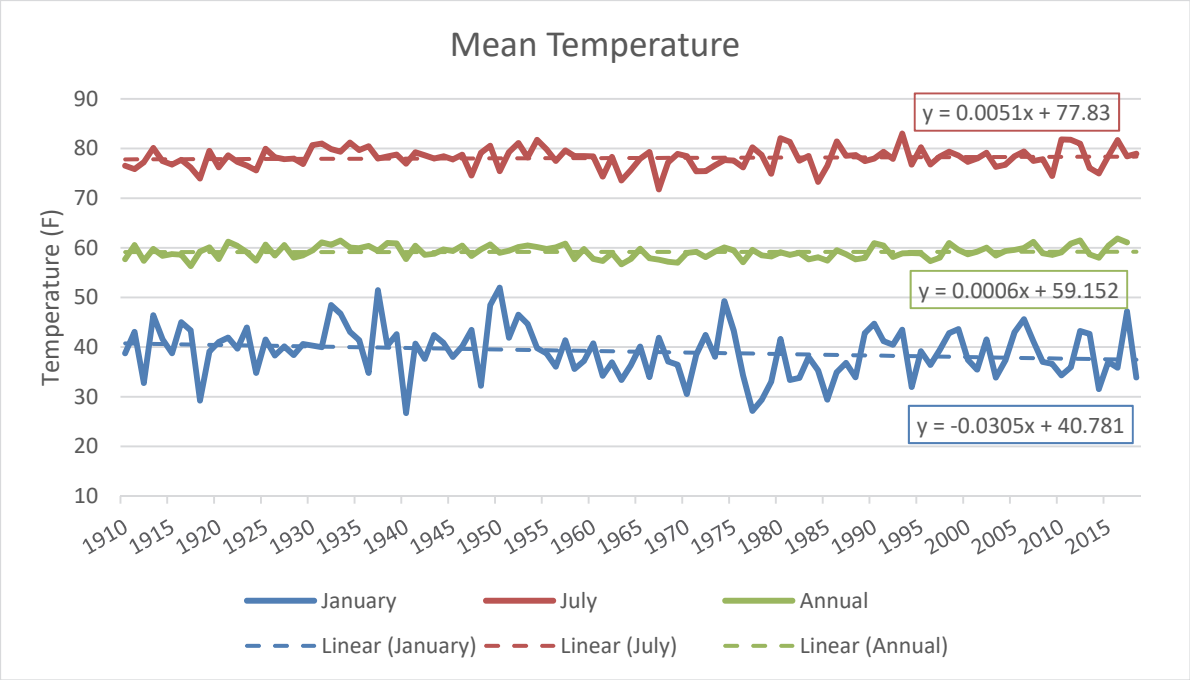

Figure 3-2. Long-Term Temperature Trends for Knoxville

3.1.2 Environmental Consequences

Implementation of the Proposed Action to retire BRF would positively affect air quality both locally and regionally by elimination of the emissions from coal-fired electricity generation. Additionally, the reduction in greenhouse gas (GHG) emissions due to a shutdown would contribute to a lessening of the rate of increase of global GHG emissions and atmospheric concentrations of greenhouse gases, especially CO_2, which has the potential to affect changes in climate. The assessment of air quality and climate impacts in this document is qualitative, given the BRF emissions contribute a small portion of criteria pollutant and GHG emissions at regional and global scales.

3.1.2.1 Alternative A: No Action Alternative

Criteria pollutant emissions from the continued operation of BRF would include emissions from the plant's boiler stack, as well as associated emissions such as those from coal mining, handling and transportation activities, and ash handling and disposal. Emission rates of BRF would be expected to remain similar to current levels, although plant utilization may decrease if competing fuels such as natural gas continue to be cost competitive.

The emissions trends of SO_2, nitrogen oxides (NO_x) and mercury for the BRF are shown in **Figure 3-3** (TVA 2018a). Note that combustion processes emit NO_x, some of which is in the form of NO_2 and some of which converts to NO_2 in the atmosphere. These emissions data show dramatic reductions of these emissions in the past 10 years compared to the prior operating periods. Some of the reduction is due to lower annual utilization of the plant, but the greatest proportion of the reductions is due to emission control retrofits to add a scrubber (2009 time frame) for removal of SO_2 and other acid gases and selective catalytic reduction (seasonal operation in 2004 and full-time operation in 2009) for NO_x removal. Note that while the SO_2 and NO_x emissions from 2010 to the present appear to be zero on the chart, they are each in the 500 to 1,000 tons per year range.

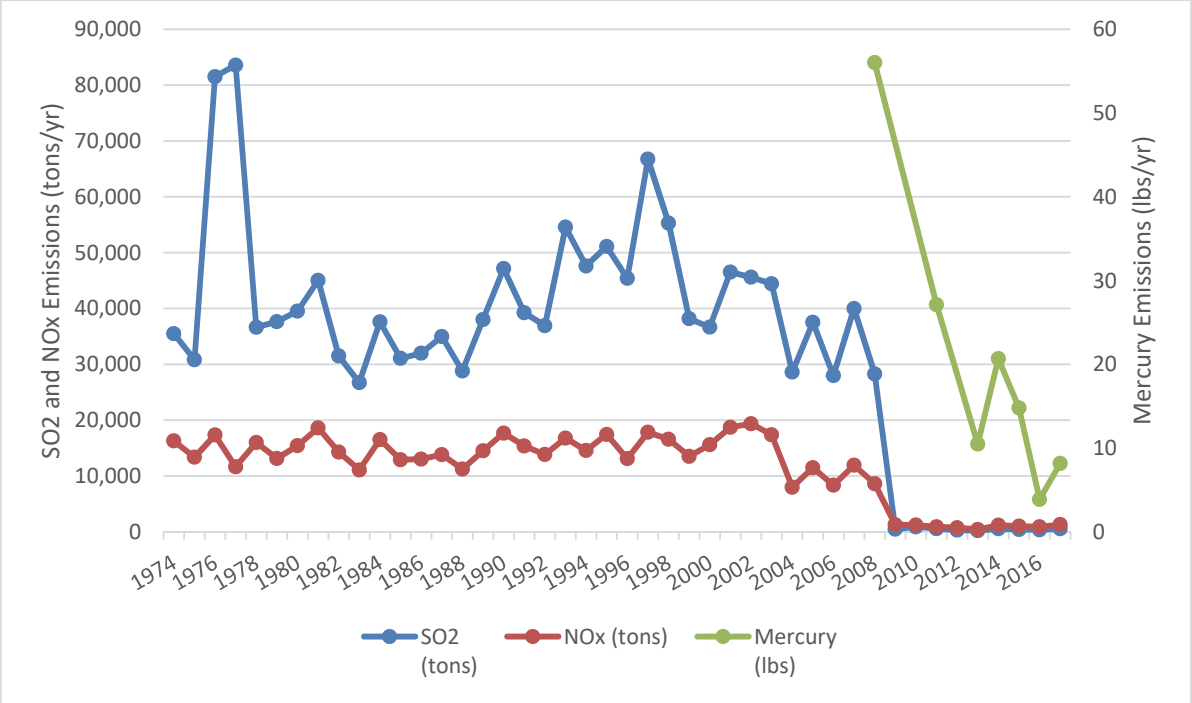

Figure 3-3. Pollutant Emissions Trends for Bull Run Fossil Plant

Similarly, trends in CO_2 emissions from BRF (USEPA 2018d) have decreased in the last decade from earlier levels, as shown in **Figure 3-4**. Because the CO_2 emissions are directly related to the amount of fuel burned, this figure shows that the plant coal use has dropped over the last decade from prior levels averaging around 5 million short tons per year to around 2.5 million short tons per year, the lowest electricity production at BRF in recent years. As with other emissions, CO_2 emissions would be expected to remain similar to current levels in the future. In general, air quality impacts associated with Alternative A are expected to be minor.

3.1.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

The retirement of BRF would eliminate its emissions as well as those from regional coal mining operations that support the plant. Given the already low and well-controlled emissions of criteria air pollutants, any local improvements in air quality are expected to be minor, and probably mostly in terms of PM_{10} particles due to elimination of activities producing localized fugitive dust.

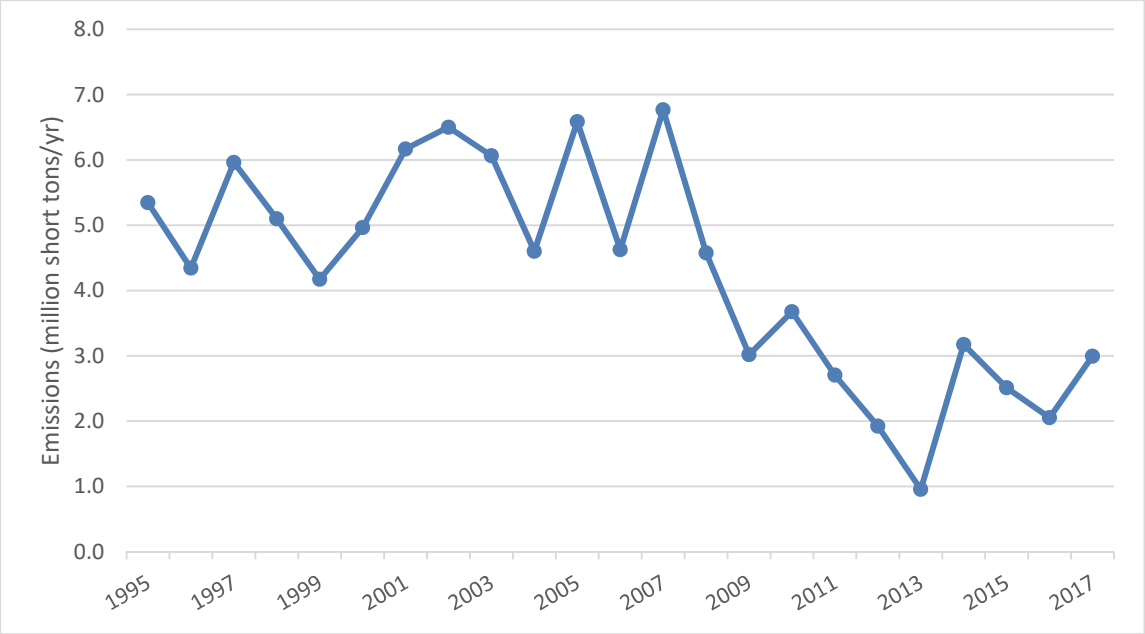

Figure 3-4. CO_2 Emissions Trend for Bull Run Fossil Plant

The combustion-related emissions of SO_2 and NO_x tend to contribute to ozone and fine particulate matter ($PM_{2.5}$) concentrations hundreds of miles downwind, especially over the northeastern U.S., given predominant wind transport direction of plumes. Since the current plant emissions of these pollutants (including during startup conditions, when elevated emissions of NO_x typically occur for a few hours) represent only a very small portion of total regional emissions of all sources, the larger-scale improvement in air quality is expected to be minor if the plant shuts down. However, together with other reductions in region-wide use of coal power plants, and substantial ongoing emissions reductions from the mobile source (vehicle) sector, downwind areas are likely to experience continued improvement in air quality and visibility, a trend which has been ongoing for decades in the U.S.

Although the net air emissions from electricity generation would likely decrease with the closing of BRF, consumer demand for electricity currently produced by BRF is unlikely to change significantly. The electricity generation of BRF must therefore be displaced by other electricity generators. The replacement capacity may include renewables, but would also likely include electricity generation fueled by natural gas. The criteria pollutant emissions from natural gas-fired electricity generation would be lower for most pollutants than the equivalent amount of coal-fired generation from BRF.

Table 3-3 shows the 2017 annual average emission rates on a pounds per megawatt hour (lb/MWh) basis for Bull Run for each of the major air pollutants (TVA 2018b). This table also shows the emission rates by pollutant for potential replacement capacity if it were in the form of natural gas-fired combined-cycle (NGCC) generation, using rates typical of Best Available Control Technology for new units. The PM emission rates provided in this table only include those from the boiler stack and do not include other sources such as material handling. The percent reductions based on substitution of 2017 BRF emission rates with NGCC emission rates are shown in the last row of **Table 3-3**.

Table 3-3. Comparison of Bull Run Average Emission Rates (lbs/MWh) for 2017 and Replacement Power from NG-Fired Combined-Cycle Plant

Basis	SO_2	NO_x	CO_2	Mercury	VOC	PM_{10}	$PM_{2.5}$
BRF	3.62E-01	8.43E-01	1.93E+03	2.63E-06	2.30E-02	1.14E-01	9.34E-02
NGCC	8.80E-03	4.66E-02	7.96E+02	8.70E-07	8.10E-03	2.76E-02	2.76E-02
NGCC % Reduction	97.6	94.5	58.7	66.9	64.8	75.8	70.4

As part of its recent analysis of its generating assets (See **Section 1.1**), TVA modeled the future operation of its generating assets with and without the retirement of BRF. This analysis is based on TVA's current power supply plan. The results of this analysis show that a majority of the generation currently provided by BRF would, following the retirement of BRF, be replaced by increased generation from NGCC plants. Most of the remainder would be replaced by increased generation at other coal plants, and a small amount by renewable sources. The retirement of BRF would result in system-wide decreases in annual emissions over the decade following retirement of up to 1.0 percent for SO_2, 1.6 percent for NO_x, and 3.0 percent for mercury.

In terms of GHG emissions, shut down of the plant would eliminate a relatively large source of CO_2 emissions. The results of the analysis described in the preceding paragraph project system-wide decreases of annual CO_2 emissions of up to 1.2 percent (589,000 tons) over the decade following retirement. The decrease in CO_2 emissions would be greater if a larger proportion of the replacement generation was from other non-emitting sources, such as nuclear and renewable generation.

3.2 Surface Water

3.2.1 Affected Environment

BRF is situated immediately adjacent to Melton Hill Reservoir, an impoundment on the Clinch River, which flows southeast in the immediate vicinity of BRF, but regionally to the southwest. There are two impoundments on the river, Norris Reservoir and Melton Hill Reservoir. Their associated dams are 31.8 miles upstream and 24.9 miles downstream of BRF, respectively. Flow in the immediate vicinity of BRF is dependent on releases at the hydroelectric plant at Norris Dam and releases at Melton Hill Dam (TVA 2016a). Melton Hill Reservoir is typically operated as a run-of-river impoundment, with little daily or seasonal water level fluctuation.

As described in Part II of the TVA 2016b, BRF has several existing wastewater streams that are permitted under NPDES Permit TN0005410. The Fly Ash Impoundment currently discharges directly into Outfall 001, while the Stilling Pond is being repurposed. This discharge and the CCW flows would be the primary discharges potentially affected by the proposed action, although many flows that make up these discharges would be altered due to this action. Approximately 10.8 million gallons per day (MGD) of effluent is discharged through NPDES Outfall 001 at CRM 48, while approximately 554 MGD of primarily non-contact cooling water are discharged from Outfall 002 per day. Primary contributing sources (greater than 1 MGD) include the, equipment cooling water, CCW, sump flows and low volume waste streams, boiler bilge sump, main station sump (equipment cooling water and leakage, service bay floor drainage, boilers leakage, and roof drains) and the stack yard sump. The current NPDES permit contains limitations on the discharges from 001 with

respect to potential hydrogen (pH), oil and grease, and total suspended solids (TSS). The permit also requires reporting of flow, general chemistry parameters (calcium, sulfate, fluoride), total metals (aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, mercury, molybdenum, nickel, selenium, silver, thallium, and zinc), and radium 226/228. Maximum daily value concentrations for effluent discharge through Outfall 001, as reported in the 2016 NPDES Permit Renewal Application are summarized in **Table 3-4**.

Table 3-4. Maximum Daily Value Concentrations for Effluent Discharge through Outfall 001

Pollutant/Parameter	Benchmark Value	Maximum Daily Value[1]
Flow	NE[2]	14.74 MGD[3]
pH	6.0 – 9.0 SU	6.97-8.31 SU
Oil & grease	16	<4.66
Total suspended solids	84	3.00
Calcium	NE	NA[4]
Sulfate	NE	130.0
Fluoride	NE	0.709
Aluminum	NE	<0.100
Antimony	NE	<0.00200
Arsenic	NE	0.00899
Barium	NE	0.0536
Beryllium	NE	<0.00100
Boron	NE	6.73
Cadmium	NE	<0.00100
Chromium	NE	0.000717
Cobalt	NE	<00200
Copper	NE	<0.00200
Iron	NE	0.168
Lead	NE	<0.000200
Lithium	NE	NA
Mercury	NE	0.00000706 ng/L
Molybdenum	NE	<0.0500
Nickel	NE	0.00548
Selenium	NE	0.0225
Silver	NE	<0.000500
Thallium	NE	<0.000500
Zinc	NE	0.0106
Radium 226/228	NE	**

Notes:

1. Maximum daily values from USEPA Form 2C for Application for Permit to Discharge Wastewater, Existing Manufacturing, Commercial, Mining and Silvicultural Operations, October 21, 2016. Units are reported in milligrams per liter (mg/L) unless otherwise noted.
2. NE – Not established; per 2018 NPDES Permit TN0005410, parameter is to be reported, but no benchmark value is specified.
3. MGD – millions of gallons per day
   SU – standard units
4. NA – Not applicable; parameter was not required for reporting prior to 2018 NPDES Permit TN0005410 renewal.
5. ** - Pollutant not believed to be present above natural background.

Based on the data reported in the 2016 NPDES permit renewal application, pH, oil and grease, and TSS concentrations were within regulatory limits. Additionally, BRF has met permit limitations for aquatic whole effluent toxicity, which further indicates that this plant

discharge is not adversely impacting aquatic organisms or water quality. To evaluate and characterize discharges from Outfall 001, an analysis was conducted to summarize the average historical discharges and the in-stream mixing concentration from BRF (**Table 3-5**).

Results of the mixing analysis summarized in **Table 3-5** demonstrate that all of the constituents except thallium met the TDEC lowest water quality criteria (i.e., limit equal to the minimum of the applicable stream designated criteria). The thallium exception is an artifact produced by high-level calculations that do not account for data with values below detection limits, and the fact that the thallium laboratory analysis detection limit of 0.001 mg/L exceeds the TDEC criterion of 0.00024 mg/L (TVA 2017).

Table 3-5. BRF Mixing Analysis of Historical Operations

Constituent	Current Baseline	Current Operations		Water Quality Criteria* Concentration (mg/L)
	Intake Concentration (mg/L)	Ash Stilling Pond Concentration (mg/L)	Total Discharge Concentration as Clinch River 1Q10 (mg/L)	
Aluminum	0.120	0.282	0.13661	NE
Antimony	<0.001	0.002	0.00062	0.0056
Arsenic	<0.001	0.0089	0.00136	0.01
Barium	0.032	0.046	0.03338	2.0
Beryllium	<0.001	<0.002	0.00055	0.004
Cadmium	<0.001	0.00697	0.00116	0.002
Chromium	<0.001	0.00187	0.00064	0.1
Copper	0.0014	0.0032	0.00159	0.013
Iron	0.130	0.463	0.16414	NE
Lead	<0.001	0.001	0.00060	0.005
Manganese	0.048	0.108	0.05415	NE
Mercury	0.00000089	000000228	0.0000010	0.00005
Nickel	00014	0.00484	0.00175	0.1
Selenium	<0.001	0.006	0.00104	0.02
Silver	0.00051	<0.002	0.00056	0.0032
Thallium	<0.001	<0.001	0.00050	0.00024
Zinc	<0.01	0.0177	0.00226	0.13

NE=not established
lbs/day = conc. in mg/L X flow in MGD X 8.34 lbs/gal.
condenser cooling water (CCW) Flow 129.3
Stilling Pond Flow 14.8
Flow s taken from NPDES flow schematic 2013 for permit, except average flow data was taken for Outfall 001 maximum discharges.
Mass Discharge and Loadings were calculated using 0.5 the Minimum Detection Limit
*TDEC Criteria, Rule 0400-40-03

The current NPDES permit contains limitations on the discharges from Outfall 002 for temperature only. The permit also requires reporting of flow and aquatic whole effluent toxicity. Based on the data presented in the 2016 NPDES permit renewal application,

temperature at Outfall 002 ranged from 24.8ºC in the winter to 27.0ºC in the summer, both of which are below the permitted daily maximum of 31.1ºC.

BRF utilizes an open-cycle cooling system. Water is withdrawn from Melton Hill Reservoir upstream of the adjacent Edgemoor Road bridge and discharged at Clinch River Mile (CRM) 47.5 (Outfall 001) and CRM 48.6 (Outfall 002). The Clinch River receives discharge from Outfall 001 (approximately 10.8 MGD) and Outfall 002 (approximately 554 MGD).

Melton Hill Reservoir has unique hydrological and thermal characteristics arising from the cold hypolimnetic releases from Norris Dam located upstream and releases from Melton Hill Dam located downstream. Shallow overbank areas and inflowing streams are often warmer than the Clinch River; at times, even with the addition of the BRF thermal discharge (TVA 2018e).

Boat surveys were conducted in August 1973 to collect water column temperature profile data in the Clinch River. The study focused on the immediate area of the discharge at CRM 46.8, thus encompassing the zone of greatest thermal influence. The report included isothermic maps showing plan views of temperature contours at various depths in the water column, indicating that the thermal plume is generally confined to the upper layers of the water column. Cross-sectional (profile) views provided for CRM 46.8 supported this observation and confirmed the presence of a lower-temperature zone of passage for fish (TVA 2018e).

The study concluded that during July, the plant intake temperature may be as much as 30°F cooler than the surface temperatures of embayments which are warmed by natural heating (TVA 2018e).

As a result, the thermal discharge from the plant will often be several degrees cooler than the water in overbank areas and the inflow of Bullrun Creek. These observations were verified by field observations in July 1976 when water temperatures of approximately 84°F were recorded in a shallow overbank region located upstream of the plant intake at a time when intake temperatures were recorded at 57°F. The maximum temperature recorded for the plant discharge at that time was 78°F (TVA 2018e).

There have been no changes at BRF that would increase the BRF thermal plume footprint (e.g., added generation units, greater capacity utilization), or any material changes in Clinch River flows that would reasonably be expected to have a major impact on the thermal hydrodynamics that characterize the plume as were measured in the 1976 study (TVA 2018e). However, one notable change has been the overall reduction in the annual capacity utilization (i.e., generation) factor for BRF. Base load coal plants have historically operated at an annual high capacity utilization factor (e.g., ~>80%). Over the last several years (2010-2017), BRF (designed to operate as a base load facility) has had an annual average capacity factor of 33%. This is due to a variety of factors that affect TVA's dispatch (selection) of diverse generation assets based on lowest fuel/operational costs. Thus, in the last several years, the single, large generating unit at BRF has been called upon to generate electricity at less frequency and duration than in the past, resulting in an overall reduction in thermal loading and associated aquatic community impacts to the Clinch River/Melton Hill Reservoir (TVA 2018e).

As part of the demonstration studies conducted for BRF in 2011, 2014, and 2016 under Section 316(b) of the CWA, TVA collected temperature data profiles in the thermally

influenced portion of the Clinch River. These data are typically collected concurrent with aquatic community sampling events. Measurements were collected in the summer of 2011 and autumn of 2014 and 2016 (TVA 2018e). The primary purpose of this activity, in accordance with the BRF § 316(a) Demonstration Study Plan, was to confirm that the study biological sampling stations were located within the BRF thermal plume.

Given the reduced capacity utilization factor for BRF, the plant was not operating in summer or autumn 2011, or autumn 2016 at the time field crews conducted the biological sampling. Thus, there was no opportunity to collect meaningful data to characterize the plume 1F2. However, profile data from the autumn 2014 survey when the plant was operational were sufficient to produce a more recent (than 1976) graphic representation of the thermal plume footprint and cross sections. The plume is confined to the upper layers of the Clinch River and there is an adequate zone of passage for fish traversing the area, as was the case in the 1976 study. Further, the recent graphic (**Figure 3-5**) (as well as the 1976 aerial thermal imagery) confirms that the § 316(a) demonstration study biological sampling stations located downstream of BRF were firmly established within the thermal plume (TVA 2018e).

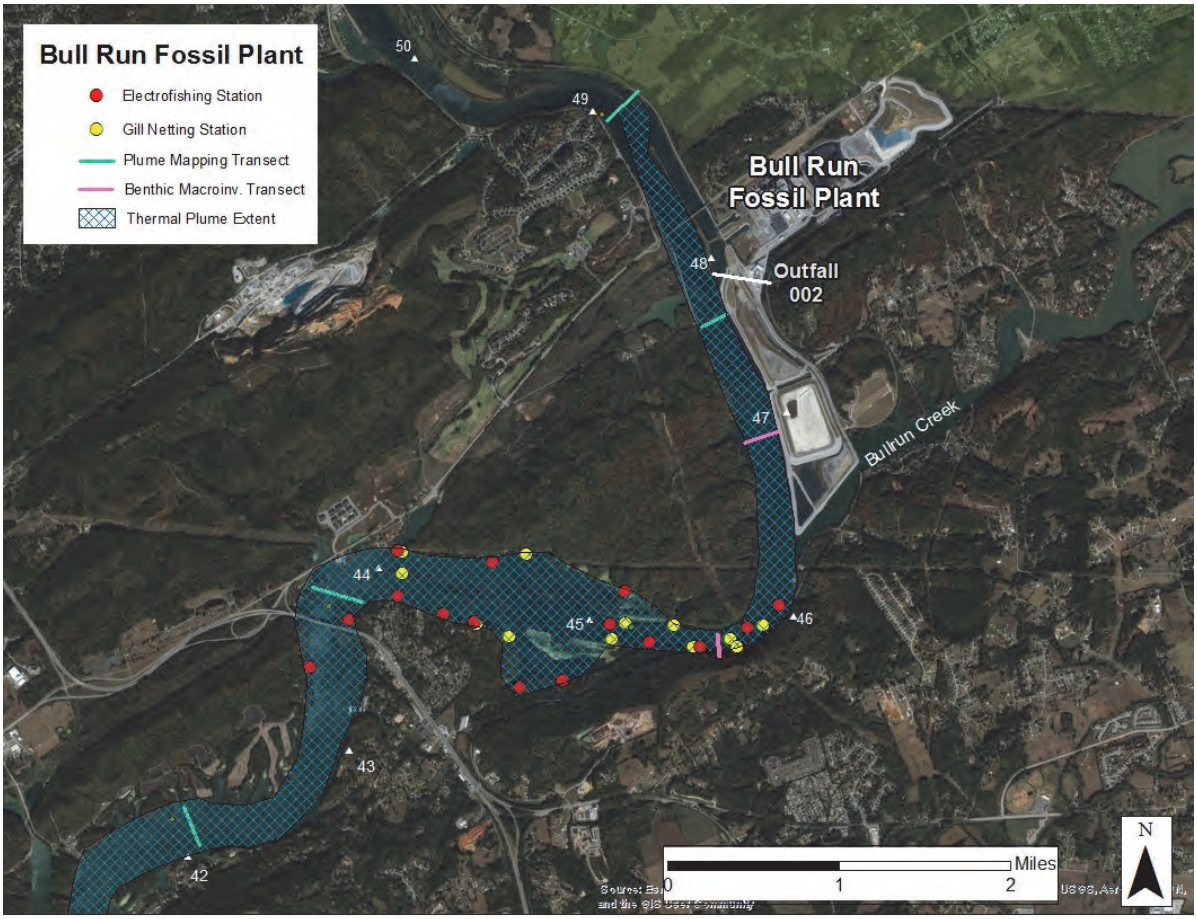

Figure 3-5. Extent of the BRF thermal plume and placement of § 316(a) biological sampling stations in the Clinch River, Melton Hill Reservoir

3.2.2 Environmental Consequences

3.2.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, BRF would continue operations. TVA would implement all of the planned actions related to the current and future management and storage of CCRs at BRF, which have either been reviewed or will be in subsequent analysis, as described in **Section 2.1.1** and **Table 2-1**. As a result, existing surface water conditions would not change from continuing operations under this alternative.

3.2.2.2 Alternative B: Retire Bull Run Fossil Plant

Under this alternative, coal burning operations would cease resulting in a substantial reduction of wastewater discharges into the Clinch River from Outfalls 001 and 002. TVA would implement all of the planned actions related to the current and future management and storage of CCRs at BRF as described in **Section 2.1.1** and **Table 2-1**. Upon closure and repurposing of impoundments and landfills, it is expected that 75 percent to 85 percent of discharge flows would cease. The remaining discharge flows would come from fire protection water, main station sumps/unwatering sumps, storm water flows, and from ponds and landfills until closed. Decreased discharge flows would impact the Clinch River by eliminating any impacts of thermal discharges as well as reducing the constituent concentrations of the discharges described in **Table 3-4**. Surface water discharges would be expected to see direct, indirect, and cumulative beneficial impacts due to the decrease in metals loading due to ceasing operations. The elimination of withdrawals of cooling water would reduce impingement and entrainment impacts, and have other beneficial impacts from reduced water consumption.

Management of the onsite storm water and process wastewater that is currently treated and discharged from the Fly Ash Impoundment and Stilling Pond would be rerouted. This re-routing would use onsite non-CCR impoundments and the lined process trench to enable the proper handling and treatment of the waste streams.

Because facility buildings, structures, and facilities would remain in place until a decision regarding the reuse of the site was made, there would be a long-term potential for direct discharges of chemicals, hazardous waste, and solid waste, including but not limited to friable asbestos releases, to receiving streams through sump discharges, storm water releases, and directly to adjacent surface waters. Periodic inspections and maintenance of the remaining facilities would be performed as needed to ensure that any contaminated equipment would not impact surface water quality. The implementation of BMPs, protocols to respond to on-site spills prior to discharge, and site clean-up would help to reduce the potential for any releases to surface waters.

With the use of proper BMPs and compliance with all Federal, State, and Local regulations and guidelines, surface water impacts associated with direct, indirect or cumulative impacts would be expected to be temporary and minor.

Additionally, surface water flow, underseepage, and groundwater releases from impoundments to surface waters would be reduced, and work would be done in compliance with applicable regulations, permits, and best management practices; therefore, potential direct and indirect impacts of this alternative on surface waters would be negligible.

3.3 Groundwater

3.3.1 Affected Environment

3.3.1.1 Physiographic Setting and Regional Aquifer

BRF is located in the Valley and Ridge Physiographic Province, which primarily consists of northeast-southwest trending valleys and ridges dipping to the southeast. The topography at BRF is typical of the province, and is a result of differential weathering of the various rock types which include limestone, dolomite, shale, sandstone, and siltstone. Residual soils in the province typically vary in thickness from about 10 to 150 feet (TVA 2017). BRF itself is underlain by four bedrock units, the Rome Formation, the Conasauga and Knox groups, and the Chickamauga Limestone (TVA 2016b).

Groundwater in the Valley and Ridge is primarily found in an irregular network of shallow bedrock fractures in shales and sandstones and in dissolution openings in carbonate rocks, up to a depth of approximately 300 feet (Brahana et al. 1986). Water-bearing fractures can occur at greater depths, but are much less common. The main plant area at BRF is underlain by the Chickamauga Limestone, and groundwater flow in that unit is controlled by fractures that have been enlarged by dissolution. These fractures store and transmit relatively large volumes of water. In other areas of the site underlain by the Rome and Conasauga units, groundwater is controlled by fractures that may store large volumes of water, but only transmit limited amounts (TVA 2012). Groundwater is also present in residual silty sand and gravel layers overlying bedrock beneath the south side of the plant.

Groundwater underlying BRF is derived from the infiltration of precipitation and from lateral inflow along the northwest boundary of the reservation. Groundwater that originates on or flows beneath BRF ultimately discharges into the Clinch River. Subsurface flow occurs in two zones, one shallow zone just beneath the ground surface, and a second zone at the bedrock interface (TVA 2017).

3.3.1.2 Groundwater Use

A 1999 survey of water wells in the vicinity of BRF indicated that there were 17 domestic wells at the time within approximately 1 mile of the BRF Dry Fly Ash Stack Lateral Expansion (TVA 2016b). In 2004, this earlier survey was confirmed by a database update from TDEC (TVA 2005). Residential well depths are unknown, but it is suspected that most wells are producing water at shallow depths in the Chickamauga Formation. Most residences located northeast and northwest of the BRF reservation rely on public water provided by the Clinton Utility Board. There is no current potential for future residential development of groundwater supplies downgradient of the facility, as all property between the facility and surface water boundaries lies within the BRF reservation (TVA 2012). However, in order to ensure that impacts are minimized, TVA in cooperation with TDEC will implement a water use survey, conduct a verification plan to establish well characteristics and groundwater use, and conduct additional sampling and analysis, as appropriate (TVA 2017).

3.3.1.3 Groundwater Quality

TVA has been monitoring groundwater quality at BRF since the 1980s in accordance with TDEC requirements. In 2016, TVA enhanced the monitoring network at BRF to comply the CCR Rule. Groundwater sampling performed under TDEC and/or CCR Rule programs indicates exceedances of maximum contaminant levels (MCLs) or statistically-derived upper prediction limits for one or more target analyses in wells sampled under these programs.

3.3.2 Environmental Consequences

3.3.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, BRF would continue operations and groundwater monitoring would continue. TVA would implement all of the planned actions related to the current and future management and storage of CCRs at BRF, which have either been reviewed or will be in subsequent analysis, as described in **Section 2.1.1** and **Table 2-1**. As a result, existing groundwater conditions would not change from continuing operations under this alternative.

3.3.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

Under Alternative B, coal burning operations would cease. TVA would implement the planned actions related to the current and future management and storage of CCRs at BRF, which have either been reviewed or will be in subsequent NEPA analysis, as described in **Section 2.1.1** and **Table 2-1**.

TVA would implement supplemental mitigation measures required pursuant to the 2015 Administrative Order issued by TDEC in August 2015, as well as the closure plan approved by TDEC, which could include additional monitoring, assessment, corrective action programs, or other actions deemed appropriate as specified in the EIP (TVA 2017a).

3.4 Aquatic Ecology

3.4.1 Affected Environment

BRF is located on the Melton Hill Reservoir, which is the portion of Clinch River that is impounded by the Melton Hill Dam (TVA 2016a). While the Clinch River is not the only water body in the vicinity of BRF (see **Figure 3-5**), it is the only one affected by BRF operations through water intake and discharges. Therefore, only the Clinch River could be effected by the Proposed Action and No Action Alternative and is the water body discussed further in this section.

Biological Monitoring of the Clinch River near BRF was conducted in the autumn of 2016 during a period when BRF was not operating. This monitoring was completed as part of a continuing effort to assure the protection of Balanced Indigenous Populations (BIPs) of aquatic species even in the presence of thermal point source discharges from BRF. A BIP is defined in the Clean Water Act Section 316(a) as a biotic community that is typically characterized by diversity appropriate to the ecoregion, the capacity to sustain itself through cyclic seasonal changes, the presence of necessary food chain species, and the lack of domination by pollution-tolerant species. During this monitoring, samples were taken within and below the thermal plume in reaches downstream of BRF and in the unaffected reaches upstream of BRF to provide a baseline for comparison (TVA 2017b).

An Entrainment Characterization Study for BRF was completed with data collected between 2013 and 2015 and an Impingement Study for BRF was completed with data collected between 2005 and 2007. These studies were conducted to determine the effects of entrainment and impingement caused by cooling water withdrawal on aquatic species (TVA 2017c, TVA 2007). Entrainment occurs when organisms small enough to pass through the intake screens (i.e., plankton, fish eggs and larvae, benthic organisms, and small fish) of the intake structures enter the condenser circulation water system (Chow et al. 1981, TVA 2017c). In addition to entrainment, impingement can occur when organisms too large to pass through the intake screens (i.e., large fish or shellfish) are physically impacted by

contact with the screens. Impingement and entrainment are considered to result in mortality (Chow et al. 1981, TVA 2017c, TVA 2007).

Habitat Quality. The 2016 Biological Monitoring survey, also referred to as the autumn 2016 survey, found that the shoreline habitat was poor in the reach downstream of BRF (i.e., the downstream reach) and fair in the reach upstream of BRF (i.e., the upstream reach). No aquatic macrophytes were observed in the upstream reach. The presence of aquatic macrophytes, however, varies from year to year depending on flow conditions and other factors. The most prevalent substrates upstream and downstream of BRF were silt and detritus. The downstream reach also had substrate of algae, aquatic macrophytes, and clay while the upstream reach also had substrates of gravel, bedrock, and sand (TVA 2017b).

During the autumn 2016 survey, water temperatures at least 3.6 °F above the upstream ambient temperature (i.e., thermal plume temperatures) were observed through the entire survey area downstream of BRF to a depth of 5 meters. Downstream of the survey area, temperatures greater than 3.6°F above the upstream ambient temperature were likely influenced more by warm inflow from tributary streams than by thermal effluent from BRF. A total of eight inflow streams enter the Clinch River between BRF's discharge and approximately 15 miles downstream. Most water flowing past BRF is cold turbine withdrawal from the Norris Reservoir upstream, which can be as much as 30°F colder than surface temperatures of embayments and inflow streams warmed by natural heating. Effluent from Bullrun Creek has been recorded to be 4 to 6°F warmer than the surface water of the Clinch River, even with the thermal effluent from BRF (TVA 2017b). BRF was not in operation during the autumn 2016 survey; however, water temperatures throughout the survey area downstream of BRF were recorded to be at least 3.6°F greater than those upstream of BRF (TVA 2017b)

In addition to temperature, water quality parameters observed during the autumn 2016 survey included conductivity, dissolved oxygen, and pH. These parameters, as well as temperature, were found to be within acceptable ranges in both the downstream and upstream reaches. Conductivity values downstream were generally higher and more variable between depths than those upstream. Dissolved oxygen concentrations upstream were less variable over depth and were within the range observed downstream. Acidity levels were slightly alkaline in both downstream and upstream reaches; however, values downstream were slightly higher (TVA 2017b). Regardless, BRF has met aquatic whole effluent toxicity monitoring, which further indicates that this plant discharge is not adversely impacting aquatic organisms or water quality (see **Section 3.2.2**). Additional information the constituents of BRF discharges (such as heavy metals) and on the water quality of the Clinch River is in **Section 3.2**.

Benthic Macroinvertebrate Community. For the benthic macroinvertebrate survey conducted in autumn 2016, three sites were sampled: one below the thermal plume (downstream), one within the thermal plume (downstream), and one upstream of the thermal plume. Generally, greater taxa richness indicates better conditions than lower taxa richness. At the site below the plume, an average of 13.6 taxa were collected, an average of 15.9 taxa were collected within the plume, and an average of 10.7 taxa were collected at the upstream site. The presence of long-lived taxa (*Corbicula*, *Hexagenia*) and organisms (mussels and snails) is indicative of conditions that allow long-term survival. At each site, at least one long-lived taxa or organism was present in each sample. Higher diversity of *Ephemeroptera*, *Plecoptera*, and *Trichoptera* (EPT) taxa indicates good water quality and

better habitat conditions. The average number of EPT taxa collected below and within the plume were 1.2 and 1.0, respectively, and the average number of EPT taxa collected upstream was 0.6. Oligochaetes are considered tolerant organisms, so a higher proportion indicates poor water quality. The average proportion of oligochaetes in each sample was high at all three sampling sites. The samples from the site below the thermal plume contained an average of 36.1 percent oligochaetes, samples within the plume contained an average of 30.4 percent oligochaetes, and upstream site samples contained an average of 51 percent oligochaetes. Additionally, a higher abundance of non-chironomids and non-oligochaetes indicates good water quality conditions. Average densities excluding chironomids and oligochaetes ranged from 1,116.7 square meters at the downstream sites to 4,343.3 square meters at the upstream site. Dominance of one or two taxa indicates poor conditions. The average proportion of total abundance comprised by the two most abundant taxa was 68.4 percent at the site below the plume, 67.3 percent at the site within the plume, and 84.5 percent at the upstream site. No “zero-samples” that indicate living conditions unsuitable to support aquatic life (i.e. toxicity, unsuitable substrate, etc.) were taken at the three sites (TVA 2017b).

Data collected from sites within and below the thermal plume downstream from BRF produced a good Reservoir Benthic Macroinvertebrate Index (RBI) score of 29, and data from the upstream site produced a slightly lower good RBI score of 27. Because the RBI scores for the two downstream sites were within 4 points of the RBI score for the upstream site, conditions among the three sites were considered to be similar and a BIP of benthic macroinvertebrates was maintained downstream of BRF. Therefore, the survey found that during autumn 2016, the benthic macroinvertebrate community in the downstream sites exhibited an ecological structure and balance equal to or better than that of the control upstream site (TVA 2017b). Additionally, no shellfish subject to entrainment or impingement occur in the vicinity of the BRF intake (TVA 2016c, TVA 2007).

Fish Community. Greater numbers of native species are a characteristic of healthier aquatic ecosystems. During the eight autumn samplings taken at BRF since 2001, more native species have been collected in the downstream reach than the upstream reach, except for the autumn 2016 survey. During that survey, 31 native species were collected in the downstream reach, 32 native species were collected in the upstream reach, and five non-native species were collected in both reaches. Centrarchid species (sunfish) indicate habitats that have reduced siltation and suitable sediment quality along the shore. Benthic invertivore species indicate better environmental quality (because their food sources tend to be reduced in degraded environments). Intolerant species are indicative of fewer environmental stressors. Six centrarchid, benthic invertivore, and intolerant species were collected in both downstream and upstream reaches during the autumn 2016 survey. The number of native fish, centrarchid, benthic invertivore, and intolerant species observed indicated that the level of diversity in both the downstream and upstream reaches were appropriate to the ecoregion and that fish diversity was similar in the downstream and upstream reaches. These results also indicated that the community downstream of BRF was able to sustain itself through seasonal change similarly to or better than that of the community upstream of BRF (TVA 2017b).

During the autumn 2016 survey, fish in the downstream reach had a higher occurrence of anomalies, indicating less favorable environmental conditions. Historically, anomalies have been rare in both communities. It was found during the autumn 2016 survey that the upstream reach had a greater proportion of omnivores and the downstream reach had a greater proportion of top carnivore species; however, proportions of the other primary

trophic guilds (insectivores and benthic invertivores) and the numbers of species representing them were similar in both reaches and exceeded surveyor expectations. The similar proportions of the numbers of fish species representing each of the primary trophic guilds indicated the presence of the necessary food chain species required of a healthy fish community. It was also found that the downstream reach had fewer occurrences of pollutant tolerant species than the upstream reach (TVA 2017b).

The fish community samples collected resulted in a good Reservoir Fish Assemblage Index (RFAI) score of 46 for the downstream reach and good RFAI score of 42 for the upstream reach. Although the score for the thermally affected downstream site was greater than the conservative threshold for maintaining a BIP (score of 45) but still within six points of the RFAI score at the upstream site, it was concluded that a BIP was maintained downstream of the thermal discharge. Therefore, the survey found that during autumn 2016, the fish community in the downstream reach exhibited an ecological structure and balance equal to or better than that of the control reach upstream (TVA 2017b).

During the Entrainment Characterization Study survey, samples were taken from transects near the intake structures and within the reservoir. Totals of 571 and 339 fish eggs were collected from the intake and reservoir transects combined during years one and two, respectively. The total number of fish larvae collected were notably different between year one (1,024 total) and year two (76,185 total); however, total taxa were similar between year one (15 total) and year two (18 total). This difference between years was likely due to the difference in flows and water temperatures past BRF between each spawning season. Norris Dam discharges and resultant high flows during the first year significantly lowered water temperatures, preventing spawning from occurring (TVA 2017c).

Total annual entrainment for the two-year study period was estimated to be 51.5 percent for fish eggs and 91.1 percent for fish larvae. These estimates were determined from the approximate number of fish eggs (20.3 million) and larvae (535 million) transported past BRF and the approximate number of fish eggs (10.4 million) and larvae (488 million) entrained due to BRF operations. The densities of fish larvae collected in intake samples indicate that spawning and nursery areas are present just upstream of the intake structures (TVA 2017c).

During the Impingement Study survey, weekly samples were taken from the BRF intake screens. Totals of 8,006 and 22,390 fish were collected during years one and two, respectively. Estimated totals for fish impinged for each year were 56,042 for year one and 156,730 for year two. While the total numbers of fish collected were notably different between years one and two, the numbers of species collected were similar between years one (23 species) and two (21 species). The increase between years was the result of a tripling in threadfin shad (*Dorosoma petenense*) impingement from 41,769 in year one to 152,971 in year two. Threadfin shad can suffer die-offs during winter due to cold-shock and be impinged after death. Analysis of the estimated total numbers of impinged fish indicated that 3,174 and 6,216 of the impinged fish in years one and two, respectively, would have been expected to survive to either harvestable size/age or to provide forage for predators (TVA 2007).

Melton Hill Reservoir Fishery. The thermal effluent from BRF attracts bait fish and sportfish during the cooler months, which provides a unique fishing opportunity in Melton Hill Reservoir from early winter to late spring. Recreationally valuable species that are found in Melton Hill Reservoir include muskellunge or “muskie” (*Esox masquinongy*),

bluegill (*Lepomis macrochirus*), redear (*Lepomis microlophus*), striped bass (*Morone saxatilis*), yellow bass (*Morone mississippiensis*), white bass (*Morone chrysops*), crappie (*Pomoxis* sp.), largemouth bass (*Micropterus salmoides*), and smallmouth bass (*Micropterus dolomieu*) (Shaffer 2018). A study characterizing the movement and temperature selection of 30 tagged adult muskellunge in the Melton Hill Reservoir was completed in 2014. This study found that when BRF was in operation in January 2011, 84 percent of tagged muskellunge occupied the associated thermal plume. No mortalities were reported after BRF operations ceased 15 days later, and the muskellunge returned to areas with typical winter water temperatures. During warmer months, the muskellunge were more evenly distributed throughout the reservoir and water column (Cole and Bettoli 2014). Additional information on the recreational use of the Melton Hill Reservoir is included in **Section 3.8**.

3.4.2 Environmental Consequences

3.4.2.1 Alternative A: No Action Alternative

Habitat Quality. Under the No Action Alternative, downstream habitat conditions would remain as described in **Section 3.4.1** and long-term, direct, and minor adverse impacts would be expected. Discharges from BRF into the Clinch River would continue to result in higher conductivity levels and alkalinity downstream when compared to the upstream environment that is unaffected by discharges. Additionally, pollutants such as heavy metals would continue to be discharged into the Clinch River. The higher conductivity levels downstream of BRF were an indication that the BRF discharge or some other source of disturbance decreased the condition of the Clinch River (USEPA 2016). While the water in the reach downstream of BRF is more alkaline than the water upstream, it is not alkaline enough to cause death, damage to gills, or an inability to dispose of metabolic wastes (Lenntech 2018). However, when water is alkaline heavy metals tend to be more toxic to aquatic organisms because they are more soluble (USGS 2018). Pollutants such as heavy metals can adversely impact the survivability and physiological processes (i.e., growth, reproduction, immune and endocrine system function, development), and behavior of aquatic organisms (USEPA 2017, Joseph et al. 2011). As described in **Section 3.4.1**, the conductivity and pH levels downstream of BRF were within acceptable ranges. As described in **Section 3.2.1**, operation of BRF has not resulted in any significant impacts to the Clinch River. Therefore, long-term, direct, and adverse impacts on aquatic habitat quality would be minor. Impacts associated with the elevated temperature of the effluent (i.e., the thermal effluent) from BRF are discussed under ***Fish and Benthic Macroinvertebrate Communities.***

Fish and Benthic Macroinvertebrate Communities. The autumn 2016 survey found that the fish and benthic macroinvertebrate communities downstream of BRF had exhibited ecological structures and balance equal to or better than those upstream of BRF (TVA 2017b). Therefore, no impacts on the fish and benthic macroinvertebrate communities would be expected from the continued discharge of thermal effluent into the Clinch River. Long-term, direct, and minor adverse impacts on individual fish and benthic macroinvertebrates would be expected from impacts to habitat quality; however, no impacts would be expected on the community level. The minor impacts on fish eggs, fish larvae, and fish would continue from entrainment and impingement; however, the severity of these impacts would be dependent upon the frequency of BRF operation, high Norris Dam discharges, and threadfin shad die-offs (TVA 2017c, TVA 2007). When Norris Dam discharges significantly cool water temperatures, spawning and therefore the occurrence of entrainment would be expected to decrease (TVA 2017c). Additionally, significant

decreases in water temperatures would be expect to increase the rate of threadfin shad die-offs in winter (TVA 2007).

Melton Hill Reservoir Fishery. Long-term, direct, and negligible impacts on the Melton Hill Reservoir fishery would be expected. While entrainment and impingement would continue to occur, the thermal effluent from BRF would continue to attract recreationally-valuable fish to the area between early winter and late spring, which could impact individual fish species; however, these impacts would not impact the fishing community (Cole and Bettoli 2014, Shaffer 2018).

3.4.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

Habitat Quality. Long-term, minor, and direct beneficial impacts on habitat quality would be expected because effluent from BRF operations would no longer be discharged into the Clinch River. This would result in a decrease in conductivity levels, alkalinity, and pollutants discharged into in the Clinch River. As described in **Sections 3.2.1** and **3.4.1**, the conductivity and pH levels downstream of BRF were within acceptable ranges and operation of BRF has not resulted in significant pollution of the Clinch River. Therefore, improvements in habitat quality would be minor. As described under Alternative A, the Lateral Expansion of South Slope Drainage Improvements project would result in long-term, direct, and beneficial impacts on habitat quality.

Fish and Benthic Macroinvertebrate Communities. Long-term, direct, and negligible adverse impacts to the fish and benthic macroinvertebrate communities downstream of BRF would be expected. Negligible adverse impacts from the removal of the thermal effluent would be expected because the distribution and abundance of fish and benthic macroinvertebrate species within the thermal plume area could be altered. These impacts would be negligible because the removal of thermal effluent would result in downstream conditions similar to those described for the upstream reach during the autumn 2016 survey, which had a similar ecological structures and balance (TVA 2017b). The overall fish and macroinvertebrate distribution and abundance throughout the Clinch River and Melton Hill Reservoir would not be impacted (Cole and Bettoli 2014, Shaffer 2018, TVA 2017b). Long-term, direct, and minor beneficial impacts on individual fish and benthic macroinvertebrates would be expected from the impacts to habitat quality (described under ***Habitat Quality)***; however, no impacts would be expected on the community level.

Long-term, direct, and minor beneficial impacts to the fish community would be expected because entrainment and impingement would no longer occur. This would eliminate a source of mortality of fish eggs, fish larvae, and fish. While the elimination of entrainment and impingement effects would positively impact the fish community, spawning would continue to be limited by Norris Dam cold water discharges (TVA 2017c). Additionally, the occurrence of threadfin shad die-offs would continue (TVA 2007).

Melton Hill Reservoir Fishery. Long-term, direct, and minor adverse impacts on the Melton Hill Reservoir fishery would be expected. The existence of the fishery is not dependent on the thermal effluent of BRF; however, removal of the thermal effluent would decrease the abundance of recreationally valuable species in the thermal plume from early winter to late spring (Shaffer 2018). A study on the abundance of tagged muskellunge in the thermal plume found that no mortalities occurred 15 days after BRF operations ceased; therefore, muskellunge and other recreationally valuable fish would likely disperse during the cooler months, but overall populations would not be expected to decrease in the Clinch River or Melton Hill Reservoir (Cole and Bettoli 2014, Shaffer 2018). Additionally,

elimination of entrainment and impingement could result in increased fish abundance (TVA 2017c).

3.5 Threatened and Endangered Species

3.5.1 Affected Environment

The Endangered Species Act (ESA) (16 USC §§ 1531-1543) was passed 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. 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. Under Section 7 of the ESA, federal agencies are required to consider the potential effects of their proposed action on endangered and threatened species and critical habitats. If the proposed action has the potential to affect these resources, the federal agency is required to consult with the U.S. Fish and Wildlife Service (USFWS).

The state of Tennessee provides protection for species considered threatened, endangered, or deemed in need of management within the state. Plant species are protected in Tennessee through the Rare Plant Protection and Conservation Act of 1985. The listing of these species is managed by the TDEC. Additionally, the Tennessee Natural Heritage Program and TVA both maintain databases of aquatic and terrestrial plant and animal species that are considered threatened, endangered, of special concern, or are otherwise tracked in Tennessee because they are rare and/or vulnerable within the state.

There are 26 federally- and/or state-listed threatened or endangered species that could occur within Anderson County (USFWS 2018, TDEC 2018c). A review of the TVA Regional Natural Heritage database in October 2018 indicated that of those species listed, 17 are currently known or have been known to occur within a 5-mile radius of BRF (TVA 2018). The Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*) and northern long-eared bat (*Myotis septentrionalis*) are the only federally-listed terrestrial species within Anderson County identified by the USFWS, and have been observed at the Oak Ridge Reservation approximately 4.6 miles from BRF. Additionally, 6 state-listed terrestrial animals and 13 state-listed plant species are currently known or have been known to occur within a 5-mile radius of BRF (TVA 2018d). The continued operation under current conditions or closure of BRF would not affect these species because no construction or demolition activities are proposed under Alternative B; therefore, terrestrial habitats would not affected by ground disturbance or tree removal. Potential impacts to these species under projects identified in **Section 2.1** will be analyzed under separate NEPA documentation for those projects should they be implemented. The presence or absence of thermal effluent associated with BRF operations could affect threatened and endangered aquatic species that are analyzed in this EA.

Nineteen freshwater mussel and one aquatic snail species are federally listed as endangered in Anderson County (USFWS 2018). Fourteen of these freshwater mussels and the aquatic snail species are also state-listed as rare or endangered within Anderson County (TDEC 2018c). **Table 3-6** lists all of the federally- and state-listed mollusks within Anderson County and includes if they have been observed within 5-miles of BRF.

Nine listed mollusk species have been observed within 5-miles of BRF (see **Table 3-6**); however, all of these species have been classified as extirpated, historical, or possibly historical (TVA 2018d). The mussel fauna in the Clinch River near BRF has been altered substantially by the impoundment of Melton Hill Reservoir and by coldwater releases from Norris Dam upstream of BRF. Only four specimens of three common mussel species (the mapleleaf, fragile papershell and three-horn wartyback) were collected along the BRF waterfront during a 2010 survey (TVA 2016a). None of the listed mollusk species were observed during the autumn 2016 survey (TVA 2017b), and no individuals or populations of these species are considered present in the Clinch River near BRF. Because no shellfish subject to entrainment occur in the vicinity of the BRF intake, the remainder of this section focuses primarily on the potential entrainment and impingement of threatened and endangered fish species (TVA 2017c).

Four federally-listed threatened fish have the potential to occur in Anderson County. Seven additional fish and two aquatic amphibian species are state-listed as deemed in need of management, threatened, or endangered in Anderson County. Table 3-6 lists all of the federally and state-listed fish and aquatic amphibian species within Anderson County and includes if they have been observed within 5-miles of BRF.

Four listed fish species are recorded within a 5-mile radius of BRF; however, one of these species (Tennessee dace) does not have suitable habitat in the Clinch River near BRF and another species (yellowfin madtom) has been extirpated. The blue sucker has been classified as possibly historical, and the spotfin chub has been verified as extant within the 5-mile radius of BRF (TVA 2018d).

The blue sucker typically inhabits fast-moving waters over firm substrates in big rivers, and the species was last observed near BRF in 1962; therefore, its occurrence is unlikely (TDEC 2018c, TVA 2018d). The spotfin chub typically inhabits clear upland rivers with swift currents and boulder substrates. The species is considered very rare and imperiled and was last observed within 5-miles of BRF in 2002 in a tributary to the Clinch River (TDEC 2018c, TVA 2018d). However, the TVA Natural Heritage database does not include occurrence of these species in the Clinch River adjacent to BRF and none of these species were observed during the autumn 2016 survey (TVA 2017b). The impoundment of Melton Hill Reservoir and coldwater releases from Norris Dam have rendered habitat conditions in the Clinch River unsuitable for these species. Additionally, no threatened and endangered fish species were collected in samples taken for the Entrainment Characterization Study or Impingement Study (TVA 2017c, TVA 2007).

The hellbender is the only state-listed aquatic amphibian with potential habitat in the Clinch River near BRF. It has been recorded within a 5-mile radius of BRF and classified as possibly historical (TVA 2018d). Hellbenders typically inhabit rocky, clear creeks and rivers with large shelter rocks and the species was last observed near BRF in 1976; therefore, its occurrence in the Clinch River adjacent to BRF is unlikely.

3.5.2 Environmental Consequences

3.5.2.1 Alternative A: No Action Alternative

No threatened and endangered aquatic species are present in the vicinity or downstream of BRF; therefore, no impacts to threatened or endangered aquatic species would be expected from the continued discharge of thermal effluent into the Clinch River. Additionally, no impacts from entrainment or impingement are expected.

Table 3-6. Aquatic Species of Conservation Concern within Anderson County and the Vicinity of BRF

	Common Name	Scientific Name	Status		Suitable Habitat Present in Clinch River?[4]
			Federal[1]	State[2] (Rank[3])	
Mollusks	Alabama lampmussel	*Lampsilis virescens*	LE	E (S1)	Yes
	Anthony's river snail	*Athearnia anthonyi*	LE	E (S1)	Yes
	*birdwing pearlymussel	*Lemiox rimosus*	LE	E (S1)	Yes
	*cracking pearlymussel	*Hemistena lata*	LE	E (S1)	Yes
	cumberland bean (pearlymussel)	*Villosa trabalis*	LE	-	Yes
	cumberland elktoe	*Alasmidonta atropurpurea*	LE	-	Yes
	*dromedary pearlymussel	*Dromus dromas*	LE	E (S1)	Yes
	fanshell	*Cyprogenia stegaria*	LE	E (S1)	Yes
	*finerayed pigtoe	*Fusconaia cuneolus*	LE	E (S1)	No
	green blossom pearlymussel	*Epioblasma torulosa gubernaculum*	LE	E (SX)	Yes
	*orangefoot pimpleback (pearlymussel)	*Plethobasus cooperianus*	LE	E (S1)	Yes
	*pink mucket (pearlymussel)	*Lampsilis abrupta*	LE	E (S2)	Yes
	ring pink (mussel)	*Obovaria retusa*	LE	-	Yes
	rough pigtoe	*Pleurobema plenum*	LE	E (S1)	Yes
	rough rabbitsfoot	*Quadrula cylindrica strigillata*	LE	-	Yes
	sheepnose mussel	*Plethobasus cyphyus*	LE	-	Yes
	*shiny pigtoe	*Fusconaia cor*	LE	E (S1)	Yes
	*spectaclecase (mussel)	*Cumberlandia monodonta*	LE	R (S2S3)	Yes

	Common Name	Scientific Name	Status		Suitable Habitat Present in Clinch River?[4]
			Federal[1]	State[2] (Rank[3])	
Mollusks (con't)	tan riffleshell	*Epioblasma florentina walkeri*	LE	E (S1)	Yes
	*white wartyback (pearlymussel)	*Plethobasus cicatricosus*	LE	E (S1)	Yes
Fish	ashy darter	*Etheostoma cinereum*	-	T (S2S3)	Yes
	blackside dace	*Phoxinus cumberlandensis*	LT	-	Yes
	*blue sucker	*Cycleptus elongatus*	-	T (S2)	Yes
	emerald darter	*Etheostoma baileyi*	-	D (S2)	No
	slender chub	*Erimystax cahni*	LT	T (S1)	Yes
	*spotfin chub	*Erimonax monachus*	LT	T (S2)	Yes
	tangerine darter	*Percina aurantiaca*	-	D (S3)	Yes
	*Tennessee dace	*Chrosomus tennesseensis*	-	D (S3)	No
	*yellowfin madtom	*Noturus flavipinnis*	LT	E (S1)	Yes
Aquatic Amphibian	Black Mountain salamander	*Desmognathus welteri*	-	D (S3)	No
	*Hellbender	*Cryptobranchus alleganiensis*	-	D (S3)	Yes

Sources: USFWS 2018, TVA 2018d, TDEC 2018c, NatureServe 2018
*Species documented within 5 miles of BRF
[1]Federal Status Codes:
LT = Listed threatened
LE = Listed endangered
- = Not Listed by USFWS
[2]State Status Codes:
E = Endangered
R = Rare, not state-listed
T = Threatened
- = Not Listed by TDEC
D = Deemed in need of management
[3]Rank Codes:
S1 = Extremely rare and critically imperiled
SX = Believed to be extirpated from the state
S2 = Very rare and imperiled
S#S# = Range of ranks; the exact rarity of the element is uncertain (e.g., S1S2)
S3 = Vulnerable
[4]Suitable habitat determination based on Clinch River description in the Aquatic Ecology section, and only considers portions of the Clinch River with the potential to be affected by the Proposed Action.

3.5.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

No threatened and endangered aquatic species are present in the vicinity or downstream of BRF; therefore, no impacts to threatened or endangered aquatic species would be expected following BRF closure.

3.6 Solid and Hazardous Waste

This section focuses on the solid and hazardous wastes produced by the operation of generating plants.

3.6.1 Affected Environment

3.6.1.1 Solid Waste

In Tennessee, requirements for management of solid wastes are focused on solid waste processing and disposal under Rule 0400-11-.01. 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. Currently, the solid waste generated at BRF is managed in accordance with federal and State requirements. The solid waste generated from the proposed activities would be from construction, operation and/or maintenance activities.

Solid (non-hazardous) wastes typically produced by common facility operations include sludge and demineralizers from water treatment plant operations, personal protective equipment, oils and lubricants, spent resins, desiccants, batteries and domestic wastes. In 2016, TVA facilities produced approximately 23,000 tons of non-hazardous solid waste. This quantity decreased to approximately 18,750 tons in 2017. The amount of waste produced at any one facility, however, can vary significantly from year to year due to maintenance, decommissioning, and asset improvement activities. In an effort to reduce waste generation, especially hazardous waste, TVA has incorporated into its procedures waste minimization efforts including reuse and recycling, substitution of less hazardous products and chemical traffic control.

On April 17, 2015, the Final Rule: Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule) was published in the *Federal Register*. Under the final rule, CCRs are not regulated as hazardous waste. The primary solid wastes that result from the operation of BRF are collectively known as CCRs. The primary CCR waste streams are bottom and fly ash and gypsum. Disposal areas for CCR include the Dry Fly Ash Stack Lateral Expansion, located east of the plant, and a system of wet CCR disposal areas (Fly Ash Impoundment and Pond 2C) located south of the plant, ending at the convergence of Bullrun Creek and the Clinch River. Approximately 3,503,000 cubic yards (cy) of CCR are currently stored in the Dry Fly Ash Stack. Approximately 972,000 cy and 51,000 cy of CCR are currently stored in the Fly Ash Impoundment and Pond 2C, respectively. BRF ceased sluicing CCR in 2015 and currently uses the wet disposal areas for non-CCR process water (TVA 2017).

The Bottom Ash and Gypsum Disposal areas at BRF were developed in 2007 and have not received CCR since September 2015. These sites do not impound water and are maintained in accordance with the existing BRF solid waste permit. These sites are considered inactive landfills and are not governed by the CCR Rule. Both the bottom ash and gypsum material streams are dewatered and new material is disposed of on-site at the Dry Fly Ash Stack. On-site CCR management capacity is limited, and TVA is currently

evaluating options for management of CCRs generated at BRF, including possibly building a new landfill (TVA 2017).

The maximum in-place quantities of CCR that are estimated to be generated at BRF daily and annually are provided in **Table 3-7** below.

Table 3-7. Average CCR Production at BRF

Solid Waste	Tons/Year	Tons/Day
Bottom and Fly Ash	240,000	660
FGD Gypsum	318,000	870
Total	558,000	1,530

Source: TVA2015.

3.6.1.2 Hazardous Waste

Hazardous materials are regulated under a variety of federal laws including the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), Occupational Safety and Health Administration (OSHA) standards, Emergency Planning and Community Right to Know Act (EPCRA), and the Toxic Substances Control Act (TSCA). Regulations implementing the requirements of EPCRA are codified in 40 CFR 355, 40 CFR 370 and 40 CFR 372. Under 40 CFR 355, facilities that have any extremely hazardous substances present in quantities above the threshold planning quantity are required to provide reporting information to the State Emergency Response Commission, Local Emergency Planning Committee and local fire department. Inventory reporting to the indicated emergency response parties is required under 40 CFR 370 for facilities with greater than the threshold planning quantity of any extremely hazardous substances or greater than 10,000 pounds of any OSHA regulated hazardous material. EPCRA also requires inventory reporting for all releases and discharges above specified reportable quantities of certain toxic chemicals under 40 CFR 372. TVA applies these requirements under EPCRA as a matter of policy. The federal law regulating hazardous wastes is RCRA and its implementing regulations codified in Title 40 CFR Parts 260-280. The regulations define what constitutes a hazardous waste and establishes a “cradle to grave” system for management and disposal of hazardous wastes.

BRF is considered a small quantity generator of hazardous waste by TDEC, generating less than 2,200 pounds of hazardous waste per calendar month. The primary hazardous wastes currently generated 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 used to clean electric generating equipment, Coulomat (used for removing moisture from oil) and liquid-filled fuses (TVA 2016).

3.6.1.3 Universal Waste

Universal wastes are a subset of hazardous wastes that are widely generated and can include batteries, lamps and high intensity lights and mercury thermostats. Universal wastes may be managed in accordance with the RCRA requirements for hazardous wastes or by special, less stringent provisions.

3.6.2 Environmental Consequences

3.6.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, there would be no change to the management of CCRs at BRF for as long as capacity is available. The production and disposal of hazardous and universal wastes are not expected to change under the No Action Alternative.

3.6.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

Under this alternative, coal burning operations would cease and no additional CCR solid wastes would be produced. Residual ash and coal dust would be washed from equipment and areas and managed through the ash handling system. TVA would implement supplemental mitigation measures required pursuant to the 2015 Administrative Order issued by TDEC in August 2015 as well as the closure plan approved by TDEC, which could include additional monitoring, assessment, corrective action programs, or other actions deemed appropriate as specified in the EIP (TVA 2017a).

TVA has no documentation to indicate that PCB-contaminated oil filled equipment is present on-site. However, given the age of the facility, lighting ballasts containing PCBs are likely present. If present, such ballasts would be removed and properly disposed offsite during preliminary activities after power termination and during the early stages of demolition.

Other materials that are removed and typically recycled in early retirement activities include used oils, glycols, and refrigerants. Consumer commodities (lubricants, aerosols, cleaners, etc.) are reused if possible, or sent for disposal if an outlet cannot be found. Laboratory chemicals would be evaluated for reuse or disposal on a case-by-case basis. Fuels and offspec fuels would be sent for recycling. Bulk chemicals/materials are typically recycled or disposed as applicable. Mercury devices, batteries, light bulbs and e-waste are recycled.

Asbestos-containing materials in building structures and systems would be remediated as necessary to be protective of environment and worker health and safety. Full abatement would occur at the time demolition activities are initiated.

Given that TVA would manage the removal and disposal of solid and hazardous wastes in accordance with local, state, and federal regulations, and recycle these wastes to the maximum extent possible, implementation of Alternative B would improve the overall quality of environmental media.

3.7 Visual Resources

3.7.1 Affected Environment

This assessment provides a review and classification of the visual attributes of existing scenery, along with the anticipated changes resulting from the proposed action. The classification criteria used in this analysis are adapted from the scenic management system developed by the U.S. Forest Service and integrated with planning methods used by TVA. The classification process is also based on fundamental methodology and descriptions adapted from Landscape Aesthetics, A Handbook for Scenery Management, Agriculture Handbook Number 701 (USFS 1995).

The visual landscape of an area is formed by physical, biological and man-made features that combine to influence the uniqueness of the landscape. Scenic resources within a landscape are evaluated based on a number of factors that include scenic attractiveness,

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 integrity is a measure of scenic importance based on the degree of visual unity and wholeness of the natural landscape character. The varied combinations of natural features and human alterations both shape landscape character and help define their scenic importance. The subjective perceptions of a landscape's aesthetic quality and sense of place is dependent on where and how it is viewed.

Scenic visibility of a landscape may be described in terms of three distance contexts:

1. Foreground. An area within 0.5 mile of the observer, individual details of specific objects are important and easily distinguished.
2. Middleground. From 0.5 to 4 miles from the observer, object characteristics are distinguishable but their details are weak and they tend to merge into larger patterns.
3. Background. In the distant part of the landscape (from 4 to 10 miles from the observer), details and colors of objects are not normally discernible unless they are especially large, standing alone, or have a substantial color contrast.

Visual and aesthetic impacts associated with a particular action may occur as a result of the introduction of a feature that is not consistent with the existing viewshed and from changes including removal of existing structures. Consequently, the character of an existing site is an important factor in evaluating potential visual impacts.

For this analysis, the affected environment includes the physical and biological features of the landscape including and surrounding BRF. BRF is located along the bank of Melton Hill Reservoir. The surrounding region is a mix of residential and limited commercial developments, forested areas, and open fields. The surrounding area is characterized by ridge and valley topography, with most of the developments in the valleys. Immediately south of BRF, the landscape is forested. To the north and east, there are pockets of forest surrounding residential areas. The mostly forested Haw Ridge Park lies to the southwest across the river from BRF.

The BRF stacks (and the plume emanating from the stacks), the expansive landfills (including the dry fly ash stack) and ash ponds, and the transmission lines leaving the plant site are the dominant elements in the existing landscape that are visible to nearby residents, motorists on nearby roadways, and visitors to nearby parks and recreation areas within the foreground and middleground. Undeveloped to sparsely developed land covered in trees comprise the overall viewscape of the area surrounding BRF. The steam plume from the stacks is prominent from middleground and background distances when the plant is operating.

Based on the above characteristics, the scenic attractiveness of the affected environment is considered to be common, whereas the scenic integrity is considered to be low to moderate (**Table 3-8**).

The "common" rating for scenic attractiveness is due to the ordinary or common visual quality of the area. 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, the scenic integrity has been lowered by extensive human alteration at BRF and by residential and commercial development. However, in the middleground and background these alterations are not substantive

enough to dominate the view of the landscape. Based on the criteria used for this analysis, the overall existing scenic value class for the affected environment is considered to be fair to good.

Table 3-8. Visual Assessment Ratings for Existing Affected Environment

	Existing Landscape	
View Distance	**Scenic Attractiveness**	**Scenic Integrity**
Foreground	Common	Low
Middleground	Common	Moderate
Background	Common	Moderate
Overall Scenic Value Class	**Fair-Good**	

3.7.2 Environmental Consequences

3.7.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, BRF would continue operations. TVA would implement all of the planned actions related to the current and future management and storage of CCRs at BRF, which have either been reviewed or will be in subsequent analyses, as described in **Section 2.1.1**. As a result, existing visual conditions, aside from the effects of future CCR management activities, would not change from continuing BRF operations under this alternative.

3.7.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

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

Under Alternative B, BRF would be retired; however, none of the physical infrastructure currently at the site would be immediately removed. The primary features in the visual environment, including the BRF stacks, the dry fly ash stack and the transmission lines leaving the plant site, would remain in place. Therefore, the overall scenic value class would remain fair to good. The one notable difference in the visual environment following retirement of BRF would be the elimination of the steam plume from the stacks. This would have a marginal positive benefit to the visual environment, particularly at background distances; however, it would not change the overall scenic value class as the rest of the facility would remain in place.

3.8 Recreation

3.8.1 Affected Environment

3.8.1.1 Definition of the Resource

The term “recreation resource” refers to both natural and human-made lands designated by planning entities to offer visitors and residents diverse opportunities to enjoy leisure

activities. Recreational resources are places or amenities set aside as parklands, beaches, trails, recreational fields, sport or recreational venues, open spaces, open waters, and aesthetically pleasing landscapes along with a variety of other uses. Federal, state, and local jurisdictions typically have designated land areas with defined boundaries for recreation. Other less-structured activities (e.g., fishing) are performed in broad, less-defined locales. A recreational setting might consist of natural or human-made landscapes and can vary in size from a roadside monument to a designated sport venue to a wilderness area. For the purpose of this analysis, recreational activities include any type of outdoor activity in which area residents, visitors, or tourists could participate and pertain to the physical geography of the area.

3.8.1.2 Existing Conditions

Several parks and recreational areas within the vicinity of BRF are described below.

Claxton Community Park, a public park with a community center, playground and athletic fields, is adjacent to the northern edge of BRF property. The recreation facilities include ball fields, children's play equipment, and a picnic pavilion.

A paved parking area with a capacity of 11 vehicles is located at the northwest corner of the BRF reservation adjacent to Edgemoor Road and just east of the Edgemoor Road bridge. This parking area is used primarily by anglers for walk-in access to the Clinch River. There is also a scenic overlook of the BRF plant along Edgemoor Road with a capacity for 7 vehicles approximately 700 feet east of the parking area.

Melton Lake Park is a City of Oak Ridge public recreation area about 2 miles upstream from BRF with a public boat ramp, boat docks, picnic shelters, and a playground. Four miles of the six-mile Melton Lake Greenway run along the lakeshore from Oak Ridge Turnpike (SR 95) south to Haw Ridge Park. About half a mile of this greenway is on the shoreline directly across from BRF. Melton Lake Park is the home of the Oak Ridge Rowing Association and hosts national rowing competitions on a course located upstream of the Edgemoor Road bridge and BRF.

Haw Ridge Park is a large City of Oak Ridge public recreation area located within the bend of the Clinch River across from and downstream of BRF. The major recreation activities at Haw Ridge Park are mountain biking and hiking. BRF CCR management facilities are readily visible from some of its shoreline trails.

A few other recreation areas occur in the vicinity of BRF. Bull Run Park is an Anderson County public recreation area about 1 mile east of the BRF reservation on an impounded portion of Bullrun Creek. It has a boat ramp, parking area, and picnic pavilion. Farther upstream along Bullrun Creek is Brushy Valley Park, a 10-acre Anderson County recreation area about 1.5 miles east of BRF. About 1 mile southeast of BRF is the Lower Bull Run Bluffs TVA Habitat Protection Area (HPA), a 4-acre natural area that features bluffs with deciduous forest and some rock outcrops that provide habitat for uncommon plants.

The National Park Service lists the Clinch River in Anderson County below Norris Dam, including in the vicinity of BRF, on the Nationwide Rivers Inventory (NPS 2018). The Nationwide Rivers Inventory is a listing of more than 3,400 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. Under a 1979 Presidential Directive, and related CEQ procedures, all federal agencies must seek to avoid

or mitigate actions that would adversely affect one or more Nationwide Rivers Inventory segments.

A section of the Clinch River, from Melton Hill Dam upstream to the Pellissippi Parkway, is designated a Class III Partially Developed River Area under the Tennessee Scenic Rivers Program (TDEC 2018). A partially developed river is defined by TDEC as rivers or sections of rivers that are free flowing, unpolluted and with shorelines and vistas essentially more developed (TDEC 2018). The Tennessee Scenic Rivers Program is a voluntary community-based partnership intended to preserve and protect the free flowing, unpolluted and outstanding scenic, recreational, geologic, botanical, fish, wildlife, historic or cultural values of selected rivers or river segments in the state.

The thermal discharge from BRF provides a unique fishing opportunity in Melton Hill Reservoir from early winter to late spring. Discharges from Norris Dam upstream are cold, and the warmer BRF discharge attracts bait fish and sportfish during the cooler months. The fishing pressure in the BRF discharge drops drastically during the rest of the year as fish disperse throughout the reservoir. This attraction to the discharge area, along with the easy accessibility, draws anglers of all levels (novice to professional guides, bank fisherman to boat anglers) to the area. Melton Hill has been referred to as a world-class muskie fishery. Many of the trophy muskie are taken from below BRF in the winter months and the fishing area is well known in the fishing community, appearing on television and in national magazines. Species with a recreational value in Melton Hill include the following:

- Muskie (Muskellunge)
- Bluegill
- Redear
- Striped bass
- Yellow bass
- White bass
- Crappie
- Largemouth bass
- Smallmouth bass

3.8.2 Environmental Consequences

3.8.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, BRF would continue its daily operations. TVA would implement all of the planned actions related to the current and future management and storage of CCRs at BRF, which have either been reviewed or will be in subsequent analysis, as described in **Section 2.1.1**. Therefore, no additional impacts on recreation, parks, or natural areas would occur.

3.8.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

This section discusses the impacts of the Proposed Action on surrounding recreational areas. Impacts on recreation would be considered significant if the Proposed Action were to preclude the use of important recreational areas for an extended period of time.

Decommissioning BRF would entail the termination of generation-related activities at the plant, which would have no adverse impact on the parks and recreation areas in the vicinity of the plant. The only potential negligible adverse impacts on recreation could result from decommissioning-related traffic along SR 170 and the elimination of the concentrated BRF fishery. It is unlikely that traffic associated with decommissioning activities would noticeably exceed current plant traffic, although the timing of BRF-related traffic could change.

Decommissioning activities, which include removal of coal and ash from boilers and other equipment, removal of hazardous materials and potential waste like materials, have the potential to affect the water quality of the Clinch River. However, these activities would be compliant with environmental regulations and have no adverse impacts on water-based recreation in the vicinity of BRF. Once decommissioned, there would be no adverse impact on the surrounding recreational areas. The elimination of the thermal discharge from BRF would eliminate the concentration of popular sportfish in the vicinity of BRF and reduce the local area's angler success and attraction to anglers. However, the overall Melton Hill fishery is not dependent on the thermal effluents of BRF and the species currently attracted to the BRF area could still be caught elsewhere in the reservoir during the winter and spring, although this would likely require greater effort.

3.9 Transportation

3.9.1 Affected Environment

BRF is served by highway and railway modes of transportation. The transportation network surrounding BRF contains roads and bridges, and rail lines. This analysis focuses on roadway and railroad traffic. BRF is served by one CSX rail line to the south of the site. Generally, BRF receives one train of coal per week and in high burn scenarios receives two trains per week.

Traffic generated by operations at BRF is composed of a mix of cars and light duty trucks as well as medium duty to heavy duty trucks. Nearby interstates are Interstate (I-) 75 and I-40. State highways provide ample access in the immediate vicinity of BRF. Principal access at BRF is via SR 170 (Edgemoor Road), which is two lanes wide. U.S. 25W, a four-lane roadway, is approximately 3.2 miles east of BRF. West of U.S. 25W, SR 170 is known as Edgemoor Road, east of U.S. 25W, SR 170 becomes Raccoon Valley Road, which is two lanes wide and continues to I-75 approximately 6.8 miles to the east.

The 2016 Annual Average Daily Traffic (AADT) on the roadways in the immediate vicinity of BRF for SR 170 (Edgemoor Road) and SR 170 (Raccoon Valley Road) are provided in **Table 3-9**. SR 170 (Edgemoor Road) is generally congested during peak hours. SR 170 (Raccoon Valley Road) is also generally congested during peak hours. Traffic associated with BRF comprises a very small proportion of the overall area traffic volume.

Table 3-9. Average Daily Traffic Volume (2016) on roadways in proximity to BRF

Roadway	Existing AADT
SR 170 (Edgemoor Road) between BRF and US 25W/SR 9	15,413
SR 170 (Edgemoor Road) between Oak Ridge and BRF	15,443
SR 170 (Raccoon Valley Road) east of US 25W	4,242
SR 170 (Raccoon Valley Road) west of Heiskell Road	3,390

Source: Knoxville TPO 2018

3.9.2 Environmental Consequences

3.9.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, BRF would continue operations. Existing transportation conditions would not change. Traffic levels on nearby roadways and rail lines would remain the same as existing conditions.

3.9.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

Under Alternative B, BRF would be retired and rail and roadway traffic to and from BRF would decrease. A small increase in traffic to and from the site would be anticipated while decommissioning activities are undertaken; however, it is unlikely that traffic associated with decommissioning activities would noticeably exceed current plant traffic, although the timing of BRF-related traffic could change. Retirement of the plant would have a negligible beneficial impact on traffic levels on nearby roadways. SR 170 (Raccoon Valley Road) and SR 170 (Edgemoor Road) would see reductions in peak hour congestion. The closure would lead to reduction in vehicle miles traveled on these roadways, which is a factor in injury and fatal traffic crash rates. The CSX rail line also would see a reduction in traffic from the closure of BRF.

3.10 Noise

3.10.1 Affected Environment

3.10.1.1 Definition of the Resource

Noise is defined as any sound that is undesirable because it interferes with communication; is intense enough to damage hearing, or is other annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. Affected receptors are specific (e.g. schools, churches, or hospitals) or broad (e.g. nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise metrics. Sound varies by both intensity and frequency. Sound pressure levels (SPLs), described in decibels (dB), are used to quantify sound intensity. The dB is a logarithmic unit that expressed the ratio of an SPL to a standard reference level. The cycles from high to low pressure each second, also called Hertz, are used to quantify sound frequency. The human ear responds differently to different frequencies. A-weighted decibels (dBA) are used to characterize sound levels that can be sensed by the human ear. “A-weighted” denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. Sound levels discussed in this EA are A-weighted.

Federal Guidelines. Agencies of the federal government have established noise guidelines for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. According to U.S. Army, Federal Aviation Administration, and the U.S. Department of Housing and Urban Development criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the day-night average sound level (DNL) exposure exceeds 75 dBA, “normally unacceptable” in regions exposed to noise between 65 and 75 dBA, and “normally acceptable” in areas exposed to noise of 65 dBA or less. For outdoor activities, USEPA recommends a DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (USEPA 1974).

Ambient Sound Levels. Noise levels vary depending on the housing density and proximity to parks and open space, major traffic areas, or airports. The noise level in a normal suburban area is typically less than 55 dBA DNL, which increases to 60 dBA for an urban

residential area, and to 80 dBA in the downtown section of a city (USEPA 1974). Most people are exposed to sound levels of 50 to 55 dBA or higher on a daily basis (**Table 3-10**).

3.10.1.2 Existing Conditions

Forested ridges buffer BRF to the north and south. The Clinch River borders BRF to the west, and on the east, BRF is bordered by a partially forested valley. Residential areas, small parks and recreation areas are in the vicinity of BRF, which are considered noise sensitive. The residences and parks closest to BRF and, therefore, most affected by plant noise, are located north, east, and west of the plant. The closest residential area is about 0.2 miles north of BRF and Claxton Community Park is adjacent to BRF.

Table 3-10. Common Sounds and Their Levels

Outdoor	Sound Level (dBA)	Indoor
Motorcycle	100	Rock band
Gas lawnmower at 3 feet	90	Food blender at 3 feet
Downtown (large city)	80	Garbage disposal
Heavy traffic at 150 feet	70	Vacuum cleaner at 10 feet
Normal conversation	60	Normal speech at 3 feet
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room

Source: USEPA 1971

During production, BRF emits varying amounts of environmental noise ranging between 59 and 87 dBA (TVA 2016). This environmental noise is created through coal unloading activities and periodic bulldozer operations related to coal pile management and truck operations. Industrial activities, transportation noise and construction noise are common sources of environmental noise emanating from BRF. Transportation noise encompasses noise from road traffic and rail traffic, though the majority of transportation noise results from road traffic. Road traffic noise is generated by the volume of traffic, the speed of traffic, and the number of trucks in the flow of the traffic (FHWA 2011). An increase in the volume, speed and number of trucks will, generally, generate increased road noise, but does not severely impact residential areas more than 500 feet from heavily used roadways or more than 100 to 200 feet from lightly used roadways. Railway noise is generated by the speed of the train and the type of engine, wagons and rails (Berglund and Lindvall 1995). The speeds of rail operations at BRF are low enough that noise generated is likely to be low (TVA 2016).

3.10.2 Environmental Consequences

3.10.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, noise levels in the environment would remain unchanged when compared to the existing conditions described in **Section 3.10.1.2**. The predominant sources of noise generated in BRF identified for the Proposed Action would continue to be industrial activities from the plant and traffic from nearby roadways. There would be no changes to plant activities.

3.10.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

This section discusses the impacts of the Proposed Action on the noise environment. Changes in noise would be considered significant if they would lead to a violation of any federal, state or local noise ordinance, or substantially increase areas of incompatible land use outside the installation. Retiring BRF would terminate regular production-related noises, which would reduce the daily ambient noise levels. Long-term impacts would be due to ceasing of industrial noises generated by daily activities at BRF.

BRF, which was built between 1962 and 1966, has been operating daily since 1967 (TVA 2016). For the past 50 years, the industrial and traffic noise emanating from the plant has become a part of the landscape. Decreasing this daily noise level would be beneficial to the surrounding environment, which experiences noise levels between 59 and 87 dBA.

Some limited construction noise may occur during the shutting down of power and energized systems. This work involves installing bulkheads and sealing tunnels and may include construction of facilities to provide alternate power sources and services, such as sump pumps and FAA stack lighting. However, this construction noise would be temporary and would have negligible or no adverse impacts on the surrounding noise sensitive areas.

3.11 Socioeconomics and Environmental Justice

3.11.1 Affected Environment

Social, economic, and sociocultural characteristics of potentially affected populations are assessed in this section using the U.S. Census Bureau (USCB) 2010 decennial census (2010 Census) and the 2012-2016 American Community Survey 5-year estimates (2016 ACS). Data for the State of Tennessee are included for comparison purposes. These data were obtained utilizing USCB American FactFinder (USCB 2018a). Where appropriate, data from other federal and state agencies are also employed.

The area considered for most of this analysis is the area from which the BRF labor market derives. The BRF labor market area is defined as Anderson County and all adjacent counties within a 20-mile radius of BRF, consisting of Blount, Campbell, Knox, Loudon, Morgan, Roane, Scott, and Union counties. While part of the potential BRF labor market, Blount and Knox counties are more urban than the other counties; thus, they are listed at the bottom of the tables provided below to better allow for comparison with the more rural counties. In this section, the BRF labor market area is referred to as the affected counties.

3.11.1.1 Demographics and Housing

Population data for the affected counties and Tennessee are provided in **Table 3-11**, based on the 2010 Census, 2016 ACS, and 2018 state data. As shown, from 2010 to 2016, population growth in all but two of the affected counties was less than the growth estimated for Tennessee as a whole. Anderson County grew at the low rate of 0.6 percent, and five other affected counties recorded population losses over that period. Tennessee Department of Health projections of population change between 2016 and 2030 show that a similar pattern is expected to occur in the future, as demonstrated in **Table 3-11**.

Table 3-11. Population Change and Future Projections

Geography	2010 Census	2016 ACS Estimate	% Change (2010 – 2016)	2030 Projected Population	% Projected Change (2016-2030)
Tennessee	**6,346,105**	**6,548,009**	**3.2**	**7,390,535**	**12.9**
Anderson County	75,129	75,545	0.6	79,329	5.0
Campbell County	40,716	40,008	-1,7	39,449	-1.4
Loudon County	48,556	50,637	4.3	59,231	17.0
Morgan County	21,987	21,688	-1.4	22,377	3.2
Roane County	54,181	52,983	-2.2	51,713	-2.4
Scott County	22,228	22,029	-0.9	21,954	-0.3
Union County	19,109	19,081	-0.1	19,495	2.2
Blount County	123,010	126,192	2.6	146,031	15.7
Knox County	432,226	448,164	3.7	509,363	13.7

Sources: 2010 Census, 2016 ACS; Tennessee Department of Health 2018

Other demographic characteristics of the nine affected counties are summarized in **Table 3-12**, based on the 2010 Census and the 2016 ACS. The populations of affected counties were generally more rural and more aged than the population of Tennessee as a whole. In all except the two more urbanized counties, there were lower percentages of people who were at least high school graduates, and higher percentages of noninstitutionalized adults aged 18 to 64 years with disabilities than in Tennessee as a whole. For the most part, higher percentages of people in affected counties maintained the same residence between 2015 and 2016 than across the state. The exception to this trend is Knox County, the most urbanized of the affected counties.

According to the 2016 ACS, six of the nine affected counties had median house values lower than the median value of owner-occupied houses across the state ($146,000). Anderson County had a median value ($132,300) $13,700 lower than that of Tennessee as a whole and $4,400 higher than the median of the affected counties ($127,900). Only Blount, Knox, and Loudon counties had higher median values than the state. The majority of affected counties, including Anderson County, had higher percentages of owner-occupied housing units and units without mortgages and lower housing rents than Tennessee as a whole. The only exception was in Knox County, the most urbanized of the affected counties.

Table 3-12. Demographic Characteristics

Geography	% Rural Pop.	Median Age	% High School or Higher	% Noninst. Labor Force w/ Disability	% Diff. House 1 Yr. Ago
Tennessee	**33.6**	**38.5**	**86.0**	**15.4**	**14.7**
Anderson County	34.7	43.3	85.5	18.9	13.2
Campbell County	55.0	43.5	74.4	23.4	11.1
Loudon County	40.6	47.2	85.3	16.4	11.9
Morgan County	99.9	41.1	79.8	22.8	14.5
Roane County	51.0	46.3	85.8	20.9	10.2
Scott County	80.6	38.8	77.3	24.5	10.8
Union County	100.0	41.5	76.9	18.2	9.3
Blount County	32.6	43.0	88.2	15.2	11.1
Knox County	10.9	37.3	90.6	13.0	16.0

Source: 2010 Census, 2016 ACS

3.11.1.2 Employment and Income

BRF directly employs 100 people. This includes a range of positions such as general laborers, steamfitters, machinists, electricians, analysts, administrators, and supervisors. In affected counties, the BRF average annual salary is within the range of earnings among an average of 7.1 percent of individuals and 10.7 percent of households based on the 2016 ACS. BRF also has contracts with coal and limestone mining operations and CSX Transportation that support additional employment and account for significant contributions to the area economy. Based on current consumption rates of 30,000 to 100,000 tons per year, the annual monetary value of BRF-consumed limestone ranges from approximately $371,400 to $1.2 million (USGS 2018). Presently, BRF purchases an average of 500,000 short tons of coal per year from one low-sulfur surface mine in Indiana. While coal production is generally declining nationally, BRF coal consumption amounts to approximately 3 percent of the total coal produced annually from surface coal mines in Indiana. BRF-consumed coal has an annual monetary value of about $21.4 million. The latest federal data show that the mining of this coal employs approximately 41 people (USEIA 2017).

BRF also has indirect and induced effects to the local economy. Indirect effects result from changes in sales, income, or employment within the BRF region, and induced effects occur through the recirculation of money received through direct and indirect income sources and the subsequent creation of additional jobs and economic activities. The sale of CCR byproducts from BRF to nearby companies is an indirect effect of BRF operation. In 2017, about 1.7 percent (1,531 tons) of the fly ash produced at BRF was sold to a local company for the production of concrete.

Table 3-13 summarizes 2016 ACS data on employment and income for the affected counties. All counties except Blount, Knox, and Union counties had lower percentages of people in the labor force than Tennessee as a whole. The average unemployment rate for the labor market counties was 8.5 percent, which was higher than the statewide rate. Anderson, Blount, and Knox counties had unemployment rates lower than that of the state. Based on data from the U.S. Bureau of Labor Statistics (USBLS), between January 2008 and July 2018, unemployment in the affected counties averaged 7.9 percent, higher than the statewide average of 7.0 percent over the same period (USBLS 2018). Total employment in Anderson County was estimated by the USBLS to be 33,456 in July 2018.

Based on the 2016 ACS, per capita income in five affected counties was lower than that of the state, with the greatest disparity in Morgan County. While not shown on **Table 3-13**, all affected counties except Blount, Knox, and Loudon counties had median household incomes lower than that of the state ($46,574). Based on the 2016 ACS, the median household income in Anderson County was $2,333 lower than the statewide median.

Pertinent civilian employment characteristics for the affected counties are also shown on **Table 3-13**. Of the affected counties, Scott County had the highest percentage of civilians employed in utilities, transportation, and related industries. In Anderson County, the largest percentage of civilian workers was employed in educational services, health care, and social assistance, followed by the retail trade and manufacturing. These industries shared the highest percentage of employees in all other affected counties as well as the state, although in differing order in some places.

Table 3-13. Employment and Income Characteristics

Geography	% of 16+ Civ. Pop. in Labor Force	Unemployment Rate	% Employed in Educ. Svcs., Healthcare, and Social Assist.	% Employed in Transpo., Warehousing, and Utilities	Per Capita Income
Tennessee	**56.1**	**7.5**	**22.7**	**6.3**	**$26,019**
Anderson County	49.0	7.4	21.1	5.1	$26,072
Campbell County	51.2	8.7	23.1	4.5	$19,948
Loudon County	42.3	7.5	19.1	6.5	$28,660
Morgan County	52.1	8.6	21.0	7.6	$18,281
Roane County	52.5	9.3	22.1	6.8	$23,942
Scott County	49.0	13.4	21.7	8.0	$21,011
Union County	59.7	9.1	20.4	6.8	$19,030
Blount County	64.1	6.5	23.6	4.9	$26,772
Knox County	56.1	6.2	24.7	4.7	$28,980

Source: 2016 ACS

TVA makes payments in lieu of taxes, also called tax equivalent payments, to states where TVA sells electricity or owns power system assets. The payments total 5 percent of gross proceeds from the sale of power in the prior fiscal year (FY), with some exclusions. In FY2018, TVA made a tax equivalent payment of $347.4 million to Tennessee (TVA 2018). Tennessee Code Annotated Title 67, Chapter 9, Part 1 (T.C.A. § 67-9-101) directs how the funds are apportioned within the state and mandates that an individual county's portion of the total payment is determined by its proportion of population, total land area, and TVA-owned land in the state.

Between early winter and late spring, BRF thermal effluent discharging into Melton Hill Reservoir, often known as Melton Hill Lake or Melton Lake, provides a unique fishing opportunity. The warm water attracts a variety of sportfish that in turn attract anglers, including some professional guides who offer charter fishing services. Of the 15 operations featured by Anderson County as offering guide services, two companies list Melton Hill Reservoir as one of the locations where they take customers to fish (Anderson County 2018).

3.11.1.3 Environmental Justice

Environmental justice-related impacts are analyzed in accordance with EO 12898 to identify and address as appropriate disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. TVA is not subject to this EO; however, TVA routinely considers environmental justice during its NEPA review processes.

CEQ guidance for applying EO 12898 under NEPA directs identification of minority populations when either the minority population of the affected area exceeds 50 percent or the minority population percentage of the study area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). The CEQ guidance also specifies that low-income populations are to be identified using the annual statistical poverty threshold from the USCB Current Population Reports Series P-60 on Income and Poverty. The current (2017) USCB-provided poverty threshold for individuals under age 65 is $12,752, and the official poverty rate for the US as a whole is currently 12.3 percent (USCB 2018b).

CEQ defines minority populations as people who identify themselves as Asian or Pacific Islander, American Indian or Alaskan Native, Black (not of Hispanic origin), or Hispanic.

Those indicating two or more races are also considered minorities due to necessarily including one of these minorities. Minority and low-income populations may be groups of people living in geographic proximity or scattered groups or individuals sharing common conditions. In addition, the CEQ guidelines direct identification of groups demonstrating differential patterns of consumption of natural resources among minority and low-income populations.

Following CEQ guidance, minority populations within affected counties that exceed the minority percentage of Tennessee as a whole (22.2 percent) are presented as the areas where the potential for disproportional environmental and human health effects may be the greatest. Minority populations were identified using 2016 ACS estimates compiled in Data Profile 5 for each of the affected counties. Low-income populations were defined as those with poverty rates above the Tennessee state poverty rate of 15.8 percent, per the 2016 USCB Small Area Income and Poverty Estimates (SAIPE) (USCB 2017). USCB recommends this source, rather than the ACS, when income and poverty are considered at the state or county levels (USCB 2018b). Low-income populations were identified at the county level using the 2016 SAIPE.

A greater proportion of the populations of affected counties identified as White Alone than across Tennessee based on the 2016 ACS (**Table 3-14**). Correspondingly, the minority populations in these counties were generally smaller proportionally than statewide. Exceptions to this are in Knox County, where there is a higher percentage of Asian Americans than the state, and in Loudon County, where Latinos comprise a larger percentage of the population than across Tennessee. The larger overall minority population in Knox County than in the other affected counties is attributable to the Knoxville metropolitan area.

Based on the 2016 SAIPE, a greater proportion of the population of four of the affected counties was living in poverty when compared with the state as a whole (**Table 3-15**). In Anderson, Blount, Knox, Loudon, and Roane counties, the proportions were lower than Tennessee as a whole. For informational purposes, the 2016 ACS percentages are also provided in **Table 3-15**.

Table 3-14. Minority Percentages and Ethnicities

Geography	% Minority	% White[1]	% Black / African American	% Am. Indian / AK Native	% Asian	% Native Hawaiian / Pacific Islander	% Some Other Race	% Hispanic / Latino[2]
Tennessee	**22.2**	**79.7**	**17.8**	**1.0**	**2.0**	**0.1**	**1.6**	**5.0**
Anderson County	8.2	94.1	5.0	1.1	1.6	0.1	0.6	2.5
Campbell County	2.2	98.9	0.7	1.1	0.3	0.1	0.1	1.2
Loudon County	5.0	96.4	1.8	0.8	0.9	0.1	1.5	7.9
Morgan County	5.7	94.8	4.9	0.5	0.1	0.1	0.3	1.1
Roane County	5.5	96.4	3.3	1.1	0.8	0.0	0.4	1.6
Scott County	1.8	99.1	0.8	0.8	0.1	0.0	0.1	0.7
Union County	2.0	99.2	0.5	1.2	0.3	0.0	0.2	1.5
Blount County	5.9	95.7	3.6	1.0	1.1	0.1	0.3	3.0
Knox County	14.4	87.5	10.0	0.9	2.5	0.2	1.1	3.8

Source: 2016 ACS

[1] Race percentages are provided for those reporting a particular race alone or in combination. Less than 3 percent of the US population reported two or more races in the 2010 Census (USCB 2018b); thus, these percentages are closely representative of the whole ethnic group population.

[2] This group is calculated separately from the other ethnicities and may include overlap from the other categories, as the USCB does not consider Hispanic or Latino a “race.”

Table 3-15. Poverty Rates

Geography	2016 SAIPE	2016 ACS		
	Poverty %	Poverty %, All Ppl	Poverty %, Age 18+	Poverty %, Ppl in Families
Tennessee	**15.8**	**17.2**	**14.9**	**14.6**
Anderson County	14.4	17.2	14.4	15.1
Campbell County	24.1	22.4	20.2	18.5
Loudon County	10.6	13.5	10.9	11.0
Morgan County	22.7	23.6	20.9	20.6
Roane County	14.2	16.2	14.8	12.6
Scott County	22.0	27.7	24.5	25.2
Union County	22.2	23.5	20.2	21.1
Blount County	11.4	13.6	11.9	10.8
Knox County	14.8	16.2	14.9	12.2

Source: 2016 SAIPE, 2016 ACS

3.11.2 Environmental Consequences

3.11.2.1 Alternative A: No Action Alternative

Under the No Action Alternative, BRF would continue operations. If BRF operations continue, several tasks or construction projects would need to be implemented in order to comply with the CCR Rule (**Table 2-1**). Completing these tasks would increase near-term TVA operating costs. These costs may have a minor adverse effect on ratepayers.

3.11.2.2 Alternative B: Potential Retirement of Bull Run Fossil Plant

Retiring BRF would eliminate projected future maintenance and environmental compliance costs, and substantial long-term savings would be realized by TVA. These savings would be expected to benefit TVA customers by maintaining low rates. There would be no significant environmental justice-related impacts under Alternative B. As shown in **Table 3-14**, the percentage of the population that identified as non-White was smaller than the state in all of the affected counties. The percentage of the population living below the poverty threshold was higher in four of the nine affected counties than in Tennessee as a whole. However, due to the lack of significant environmental impacts as described in this chapter and the generally light concentrations of minority populations in the affected counties, no disproportionate human health or environmental impacts to disadvantaged populations are projected. Minor positive indirect effects to minority and low-income populations may occur due to beneficial changes to air quality with implementation of the Proposed Action.

Following the Proposed Action, BRF would no longer be a local employment option, and the 100 people currently employed by BRF may become temporarily unemployed. While this decrease in employment represents less than 0.3 percent of total employment in Anderson County (USBLS 2018), minor direct adverse economic impacts to the area would result. TVA would help offset this employment loss by placing some interested employees in available positions across the TVA PSA, provided the employees are willing to relocate. Current BRF employees may potentially find alternative employment in the BRF vicinity in other prominent fields, including educational services, health care, and social assistance; manufacturing; and retail trades. However, based on the 2016 ACS, the median earnings for full-time employment in these industries in affected counties are approximately $19k to 29k less on average than in the utilities industry. The proximity of Anderson County to more urbanized Knox County may help offset the need for BRF employees and any associated family members to relocate to different locations in the state or beyond.

Mining of BRF coal at 2018 levels provides employment for approximately 41 people in Indiana (USEIA 2017). The mining of limestone for use at BRF and the transportation of limestone and coal to BRF provides additional regional employment. Unless the coal and limestone mines find alternative markets for the tonnage currently purchased by BRF, minor indirect adverse economic impacts to the affected counties and a portion of Indiana would occur from closure of this facility. The providers of other goods and services to BRF would also be adversely affected by the BRF retirement.

Based on TVA economic analyses, TVA tax equivalent payments to the state of Tennessee are expected to decrease with implementation of the Proposed Action.

The unique fishing opportunity that occurs in Melton Hill Reservoir as a result of BRF thermal effluent would likely be affected by implementation of the Proposed Action. With closure of BRF, warm water would no longer be discharged into the reservoir in the winter and spring months, and fewer anglers may fish the reservoir during the seasonal opportunity. The two professional guide services in Anderson County known to bring customers to the lake may be among affected anglers, and they may lose income as a result. Thus, additional minor indirect adverse economic impacts would occur with BRF closure.

3.12 Cumulative Impacts

The CEQ regulations (40 CFR §§ 1500-1508) implementing the procedural provisions of the NEPA of 1969, as amended (42 USC § 321 et seq.) define cumulative impact as: "…the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions." (40 CFR § 1508.7).

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, therefore, incorporates the cumulative impacts of past and present actions.

3.12.1 Scoping for Cumulative Impacts Analysis

TVA evaluated a full range of environmental resource issues associated with Alternative B for inclusion in the cumulative effects analysis. The landscape surrounding the existing BRF facility is already subject to environmental stressors associated with industrial operations and previous disturbance of the site. Consequently, as has been described in prior subsections of this EA, the existing quality of environmental resources potentially directly or indirectly affected by project activities ranges from low to good.

This analysis is limited to those resource issues potentially adversely affected by project activities. Accordingly, air quality, surface water, groundwater, threatened and endangered species, solid and hazardous waste, visual resources, 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 negligible. Primary resource categories specifically considered in this cumulative effects assessment include aquatic ecology, noise, transportation, and socioeconomics.

3.12.2 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, two general geographic areas were considered appropriate for consideration in this analysis:

- *Lands within Anderson County in the Vicinity of the BRF.* This geographic area provides an appropriate framework for the consideration of potential cumulative impacts to noise, transportation, and socioeconomics. This geographic area includes near off site areas and the 10-mile radius within Anderson County.
- *Waters and Wetlands within the Vicinity of the BRF*. This geographic area contains aquatic resources considered as part of the analysis of impacts to aquatic ecology within a 10-mile radius of BRF. Wetland complexes and aquatic ecosystems are hydrologically and physically contiguous with similar resources potentially affected by the proposed project.

3.12.3 Identification of "Other Actions"

Past, present and reasonably foreseeable future actions that are appropriate for consideration in this cumulative analysis are listed in **Table 3-16**. These actions were identified within the geographic area of analysis as having the potential to, in aggregate, result in larger and potentially adverse impacts to the resources of concern. This section supplements preceding analyses that include in some degree the potential for cumulative adverse impacts to the region's environment that could result from the implementation of the projects proposed to manage CCR at BRF. TVA would implement the reasonably foreseeable future actions (RFFAs) related to the current and future management and storage of CCRs at BRF, which have either been reviewed or will be in subsequent NEPA analysis, as described in **Section 2.1.1** and **Table 2-1.**

Actions that are listed as having a timing that is "past" or "present" inherently have environmental impacts that are integrated into the baseline 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.

3.12.3.1 Mechanical Dewatering Facility

In 2012, TVA installed equipment to remove water from gypsum and bottom ash generated at BRF (TVA 2012). The equipment is located in a pre-engineered building located southwest of the powerhouse. Installation of the mechanical dewatering facility has allowed TVA to close wet CCR handling and disposal operations at BRF. Impacts of this past action are inherent within the baseline condition of the Affected Environment.

3.12.3.2 House Demolition

TVA purchased approximately 166 ac adjacent to BRF to expand the plant boundary (TVA 2013). Several of the homes and structures were removed by previous owners of the property before TVA took ownership; however, some vacant structures remained, including dwellings, garages and out-buildings. To minimize the risk to human health and safety, TVA decided to demolish and remove the remaining structures. Impacts of this past action are inherent within the baseline condition of the Affected Environment.

Table 3-16. Summary of Other Past, Present, or Reasonably Foreseeable Future Actions in the Vicinity of the Proposed Action

Action	Description	Project Type
Mechanical Dewatering Facility	Installation of mechanical dewatering facility for dry storage of ash and gypsum at BRF	Past
House Demolition	166 ac purchase adjacent to BRF to expand plant boundary	Past
BRF Ash Impoundment Closure*	Closure of ash impoundments at BRF facility	RFFA
Bottom Ash Complex Closure*	Construction of coal ash complex	RFFA
Gypsum Impoundment Closure*	Closure of gypsum impoundment	RFFA
Partial Fly Ash Impoundment Closure*	Closure of partial fly ash impoundment	RFFA
Process Water Basins*	Closure of process water basins	RFFA
Stilling Pond Closure*	Closure of stilling pond	RFFA
Lateral Expansion of South Slope Drainage*	Expansion of south slope drainage	RFFA
Deconstruction and demolition of BRF	TVA would deconstruct and demolish BRF.	RFFA
Road improvements on SR 170	Tennessee Department of Transportation is currently studying improvements, including widening, of 6.2 miles of SR 170 (Edgemoor Road) between SR 9/US 25W (Clinton Highway) and SR 62 (South Illinois Avenue).	RFFA

*project description provided in Section 2.1.1 and Table 2-1.

3.12.3.3 BRF Ash Impoundment Closure

TVA has evaluated alternatives to close ash impoundments at BRF under the CCR Rule (TVA 2016). The preferred closure method evaluated in the ash impoundment EIS is closure-in-place, which would involve dewatering, grading and reconfiguring the CCR and installing an approved cover system with a protective soil cover. In addition, a groundwater monitoring system would be installed and operated per state requirements. Ash impoundments at BRF are expected to be closed within a five-year period.

3.12.3.4 Deconstruction and Demolition of BRF

If TVA decides to retire BRF, actions associated with deconstruction and demolition of BRF, as well as the subsequent use of the BRF site, would be addressed in a future planning process that will include public and agency input. After these activities are completed, the site could have the potential for redevelopment or reuse.

3.12.3.5 Proposed Improvements to SR 170

Tennessee Department of Transportation is currently studying improvements, including widening, of 6.2 miles of SR 170 (Edgemoor Road) between SR 9/US 25W (Clinton Highway) and SR 62 (South Illinois Avenue).

3.12.4 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 Section 1508.7 and may include individually minor, but collectively significant actions taking place

over a period of time. The potential for cumulative effects to the identified environmental resources of concern are analyzed below for Alternative B.

3.12.4.1 Aquatic Ecology

As described in **Section 3.4.2.2**, impacts to aquatic ecology under Alternative B would be expected from the removal of the thermal effluent currently discharged into the Clinch River. Other identified actions that have the potential to contribute to aquatic resource impacts include the closure of the ash impoundments. In order to close the impoundment, the current surface water would need to be decanted. The wastewater discharges during this process would meet existing permit limits, and compliance sampling would be performed at the approved outfall structure in accordance with the NPDES permit to demonstrate compliance. Any CCR construction activities would adhere to permit limit requirements and would utilize BMPs to minimize indirect effects on aquatic resources in the Clinch River. If improvements to SR 170 result in an impact to waters and aquatic ecology, BMPs and compensatory mitigation would likely be required and would minimize impacts in the Clinch River. However, given the local abundance of similar aquatic resources within the region and the implementation of BMPs during construction for all identified projects, watershed level cumulative impacts to aquatic resources are not anticipated under Alternative B.

3.12.4.2 Noise

The decommissioning of the BRF under Alternative B would result in short-term, minor, adverse impacts on the noise environment from decommission-related transportation activities from nearby Tennessee SR 170 and smaller local roadways. BRF ash impoundment closure would also contribute to a short-term increase in local traffic on nearby roadways which would contribute to increased noise levels. During planning for potential improvements to SR 170, noise analyses and consideration of noise abatement would be conducted under a separate NEPA review by Tennessee Department of Transportation. When considered together, the short-term and intermittent nature of the impacts would not be expected to contribute to a cumulative impact.

RFFAs, such as the construction of CCR projects or the deconstruction and demolition of BRF, could also result in short-term, minor, adverse impacts to noise. Noise generated by construction or demolition projects is expected to be minor with a relatively minor amount of heavy machinery needed to carry out those projects. Most construction or demolition activities would occur during the day on weekdays; however, construction activities could occur at night or on weekends, if necessary. All of the construction activities occur within the BRF site boundary.

3.12.4.3 Transportation

The decommissioning of the BRF under Alternative B would result in short-term, minor, adverse impacts on SR 170 and smaller local roadways. Improvements to SR 170 are in the early planning phase, and will include an analysis of transportation and traffic effects as part of a separate NEPA review. The construction of RFFAs, such as the CCR projects, or the demolition of BRF could also contribute to a short-term increase in local traffic on nearby roadways. These projects may not overlap with potential improvements to SR 170. When considered together, the short-term and intermittent nature of the impacts would not be expected to contribute to a cumulative impact.

3.12.4.4 Socioeconomics

The decommissioning of the BRF under Alternative B would result in minor, direct adverse economic impacts from the direct loss of about 100 jobs. As noted in TVA's previous

analysis of the CCR activities, demographic characteristics of the project area are expected to change temporarily in response to an increased construction workforce, but this change would not be significant. No additional permanent workers would be employed during operation of the landfill or dewatering facilities. If improvements to SR 170 occur, a temporary increase in the construction workforce may occur. The RFFAs are not anticipated to contribute to additional impacts; however, after the deconstruction and demolition of BRF, the site could have the potential for redevelopment or reuse. Overall, the cumulative impacts associated with this project are expected to be minor.

3.13 Unavoidable Adverse Environmental Impacts

Unavoidable adverse impacts are the effects of the proposed action on natural and human resources that would remain after mitigation measures or best management practices (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. The selected alternative would not cause any unavoidable adverse environmental impacts.

3.14 Relationship of Short-Term Uses and Long-Term Productivity

BRF would be retired and actions related to decommissioning, deactivation and decontamination would be implemented. In the long term, the site could become productive if commercial or industrial developments were to be established, thereby producing employment opportunities and tax revenue and enhancing long-term productivity of the site.

3.15 Irreversible and Irretrievable Commitments of Resources

An irreversible or irretrievable commitment of resources would occur when resources would be consumed, committed, or lost because of the project. The commitment of resources would be irreversible if the project started a process (chemical, biological, or physical) that could not be stopped. Similarly, commitment of a resource would be considered irretrievable when the project would directly eliminate the resource, its productivity, or its utility for the life of the project and possibly beyond. Retiring BRF would not result in any irreversible or irretrievable commitments of resources.

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CHAPTER 5 – ENVIRONMENTAL ASSESSMENT RECIPIENTS

5.1 Federal Agencies

- U.S. Fish & Wildlife Service, Cookeville, Tennessee
- U.S. Environmental Protection Agency, Region 4, Atlanta, GA
- U.S. Army Corps of Engineers, Eastern Regulatory Field Office, Lenoir City, TN

5.2 State Agencies

- Tennessee Department of Environment Conservation, Nashville
    - CCR Waste Program
    - NPDES Program
    - Policy and Planning Office
    - Solid Waste Program
    - Water-Based Systems
    - Water Resources
- Tennessee Department of Transportation, Nashville
- Tennessee Historical Commission, Nashville
- Tennessee Wildlife Resources Agency, Nashville

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TVA Responses to Public and Agency Comments on the Draft EA

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APPENDIX A –Responses to Public and Agency Comments on the Draft EA

Introduction

The public and agency involvement in the preparation of this EA included a 30-day public review of the draft EA. The availability of the draft EA was announced in two newspapers that serve the Anderson County area: *The Clinton Courier* and *The Oak Ridger*. TVA also announced the availability of the draft EA in a press release posted on the TVA website. Notices of the availability of the draft EA were also sent to local, state, and federal agencies. Comments were accepted from November 19, 2018, through December 19, 2018, via TVA's website, mail, and e-mail.

The comments submitted to TVA are reprinted in Appendix B. This appendix restates the comments received and provides responses to the comments. The comments are organized by topical area. Several of the topics were addressed by multiple comments and these are consolidated into the comment statements listed below. The names of the commenters associated with each topic are listed with the comment statement. Several comments were submitted directly to the TVA Board of Directors by the public and agencies after the closure of the comment period. These comments addressed topics included in the previously submitted comments and are not otherwise addressed below.

The Sierra Club submitted a form letter in support of the potential retirement of Paradise Fossil Plant (evaluated under a separate EA) and Bull Run Fossil Plant. The letter also stated that TVA should provide a just transition for TVA employees and the surrounding communities affected by the potential retirement of these facilities. The letter was signed by 613 Sierra Club members and contained individualized messages from 274 Sierra Club members. The individualized messages addressed topics raised in other comments and are not otherwise addressed below.

Future Use of the Bull Run Site

If the plant is retired, TVA, Department of Energy, and Oak Ridge National Laboratory should consider using the site to house a new supercomputer. The site has the necessary electrical lines, cooling water, and space for offices and laboratories. ***Ron Mulig***

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If TVA decides to retire BRF, actions associated with deconstruction and demolition of BRF, as well as the subsequent use of the BRF site, will be addressed in a future planning process that will include public and agency input.

If TVA decides to retire Bull Run, we support the quick decommissioning and redevelopment of the plant site. Because of its size, location, and access to rail, road, and water, the site is ideal for major significant economic development. ***Terry Frank –***

Anderson County Mayor, and Tracy Wandell – Anderson County Commission Chairman; Warren Gooch – Oak Ridge Mayor

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If TVA decides to retire BRF, the subsequent use of the site will be addressed in a future planning process that will include public and agency input. TVA acknowledges that the site may be attractive for future economic development.

If TVA decides to close Bull Run, it is unacceptable for it to leave the site with empty buildings and mountains of coal ash. TVA should work closely with the City of Oak Ridge, Anderson County, the Tennessee Department of Transportation, the Tennessee Department of Environment and Conservation, and the U.S. Army Corps of Engineers to study the return of the site to private sector hands and its future uses following plant removal and site restoration. *Warren Gooch – Oak Ridge Mayor; Ryan Parrish*

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. Any action to retire BRF would also include actions to decommission, deactivate and decontaminate the site to minimize environmental and safety risks consistent with applicable laws and regulations. The subsequent use of the site will be addressed in a future planning process that will include public and agency input. TVA acknowledges that the site may be attractive for future economic development.

The Bull Run site is valuable for redevelopment for an energy-related use such as gas turbines, a solar farm, small modular reactors, or an electricity storage facility. Alternatively, it is valuable for private industrial or commercial use. *Ellen Smith; JoAnn McIntosh*

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If TVA decides to retire BRF, the subsequent use of the site will be addressed in a future planning process that will include public and agency input. TVA acknowledges that the site may be attractive for future economic development, including energy-related use.

The transmission infrastructure connected to the Bull Run site should remain in place if the plant is retired. It is a valuable asset for the reuse of the site by electricity-hungry industry such as data centers. *Robert Kennedy, Oak Ridge Environmental Quality Advisory Board*

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If TVA decides to retire BRF, the subsequent use of the site will be addressed in a future planning process that will include public and agency input. TVA acknowledges that the site, with its transmission infrastructure, may be attractive for future economic development, including its potential use as a data center.

Purpose and Need

While Bull Run has had a lower equivalent availability than in past years, with additional maintenance and prudent operational practices it could continue to provide necessary reliable and economical base-load power. ***Senator Ken Yager***

TVA Response: Bull Run Fossil Plant was designed to provide base load generation. The recent increase in nuclear generation, which produces power at a lower cost per MWh, has displaced Bull Run as baseload generation. Bull Run was not designed to follow load or frequently cycle on and off, and as such, is more costly and less effective operating in this manner than other gas and coal units in the portfolio.

Bull Run should not be retired because it provides:

- **Critical fuel diversity during extreme weather**
- **Fuel security through the coal stockpile, which provides adequate fuel for a substantial time period**
- **Flexibility in operation, even if it is not as flexible as in recent years**
- **Important employment, both directly and indirectly, as well as economic activity through the purchase of goods and services.**

Senator Ken Yager; Warren Gooch – Oak Ridge Mayor

TVA Response: As part of the analysis of the potential retirement of BRF, TVA conducted a fuel resiliency study, selecting a third party (IHS Markit) to develop a framework to evaluate TVA's fuel resiliency with and without the retirement. The study evaluated the fuel resiliency of all generating assets in the portfolio using the following criteria: fuel supply; fuel delivery; inventory; and backup contingencies. The study findings indicate that TVA's overall fuel supply position is among the most resilient in the U.S. due to a well-diversified generation portfolio, advantageous location with respect to major gas pipelines, access to multiple coal supply and transport options, and a strong and resilient program to secure nuclear fuel. The analysis in the study indicated that reducing the coal fleet would not materially impact TVA's fuel resiliency.

Bull Run was designed to provide base load generation. Increases in nuclear generation, which produces power at a lower cost per MWh, has displaced BRF as baseload generation. Bull Run was not designed to follow load or frequently cycle on and off, and as such, is more costly and less effective operating in this manner than other gas and coal units in the portfolio.

Findings from the EA indicate retirement of Bull Run, while having identifiable economic impacts to Anderson County and the surrounding area, would have minor cumulative economic impacts across the Tennessee Valley. This and any decisions made about TVA power generation assets are made in the best interests of TVA customers, employees and the citizens across the Tennessee Valley as the resulting savings drive lower power rates overall and enable economic development.

An adequate, uninterruptible power supply is critical to Anderson County to serve industry and the DOE Y-12 facility, as well as for the DOE ORNL facility in Roane County. The loss of this service could be detrimental and possibly economically crippling. ***Terry***

Frank – Anderson County Mayor, and Tracy Wandell – Anderson County Commission Chairman

TVA Response: TVA conducts annual transmission grid reliability studies based on NERC Regulatory Standards to ensure continued high level of reliability to Anderson and Roane Counties, as well as the rest of the TVA service area. These studies evaluate system reliability in multiple scenarios, including scenarios with Bull Run offline. Through these annual studies, TVA identifies and then implements projects needed to maintain or enhance the reliability and resiliency of the transmission system.

With the increasingly variable supply and demand for electricity, an appropriate beneficial reuse of the Bull Run site would be grid-scale energy storage. *Robert Kennedy, Oak Ridge Environmental Quality Advisory Board*

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If TVA decides to retire BRF, the subsequent use of the site will be addressed in a future planning process that will include public and agency input. TVA acknowledges that the site may be attractive for future economic development, including an energy-related use such as grid-scale energy storage.

Description of Alternatives and Mitigation Measures

Rather than retiring Bull Run, replace the boiler with a Benson-type boiler. This would give the plant the ability to burn natural gas, as well as coal, providing a hedge against future gas price increases. It would also better align with the changing mission of the plant. *Hal Stephens*

TVA Response: Given the high costs of conversion and securing gas supply in this region it would not be a feasible option for TVA to replace the existing boiler at Bull Run with a Benson-type boiler. Economic analysis indicates that Bull Run capacity would eventually be replaced with a combination of solar and gas generating resources at lower cost and lower risk.

BRF should be retired and the power it generates should be replaced by more solar and wind power, as well as increased energy conservation in the residential, commercial, and transportation sectors. *Nancy Munro; Gene Burr; Sam Dornan; Joanne Logan; Catherine Olsen; Joe Ozegovich*

TVA Response: Comment noted. Under the current load outlook, economic analysis indicates that Bull Run capacity would eventually be replaced with a combination of solar and gas generating resources at lower cost and lower risk. Demand response programs could also be leveraged as a partial replacement. An asset portfolio without BRF would have a small reduction in coal generation, as well as lower emissions of CO_2 and other air pollutants, water consumption, and waste production.

Under Alternative B, the plant would be retired but the buildings and other structures would remain in place. Because of the potential for discharges of chemicals, hazardous

waste and solid waste, TVA should commit to periodic inspection and maintenance of remaining facilities to prevent the discharge of pollutants. ***Larry Gissentanna – EPA***

TVA Response: Comment noted. See Section 2.1.3.1 for a description of actions TVA would take at the time of retirement to manage chemicals and wastes. In accordance with BMPs and permit requirements, TVA would periodically monitor the structures for degradation and conduct limited removal and maintenance activities as necessary to prevent the discharge of pollutants.

Under Alternative B, TVA should commit to implement the supplemental mitigation measures required pursuant to the 2015 Administrative Order issued by TDEC in August 2015. This includes the closure plan, and additional monitoring, assessment, corrective action programs or other actions deemed appropriate as specified in the 2017 Environmental Investigation Plan. ***Larry Gissentanna – EPA; Melanie Mayes***

TVA Response: In addition to state and federal water and waste regulations, TVA's CCR disposal areas at BRF, including the impoundments, are subject to the 2015 Commissioner's Order entered by the Tennessee Department of Environment and Conservation (TDEC). Investigations at BRF under that order are ongoing and TVA will comply with any requirements as a result of the Commissioner's Order.

TVA should be making a concerted effort to provide its workers and local communities with just transitions following the retirement of Bull Run. ***Zachary Fabish – Sierra Club, and Stephanie Kodish – NPCA***

TVA Response: Comment noted. As done with other TVA sites impacted by fleet changes, TVA would work with employees to help them through the transition. TVA values the contributions of its employees, and their commitment to working efficiently and safely. If TVA decides to retire BRF, TVA would seek to place as many affected employees as possible into other TVA positions if they are willing to relocate. TVA is sensitive to local economic impacts and would conduct additional assessments to determine the best reuse of the BRF site.

TVA should consider using alternative-fueled and/or electric-powered equipment for site maintenance activities to reduce noise levels and air emissions. ***Kendra Abkowitz – TDEC***

TVA Response: Comment noted.

The Final EA should include a discussion on how TVA will identify asbestos containing material in advance of planning for the management of asbestos removal. ***Kendra Abkowitz – TDEC***

TVA Response: As noted in Section 3.7.2.2 of the EA, asbestos-containing materials in building structures and systems would be remediated as necessary to protect environment and worker health and safety. Full abatement would occur at the time demolition activities are initiated. TVA would manage the removal and disposal of solid and hazardous wastes in accordance with local, state, and federal regulations, and recycle these wastes to the maximum extent possible.

The coal ash at Bull Run should be cleaned up and moved away from Melton Hill Reservoir, where it threatens water quality. ***John Todd Waterman; William Dean***

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. Coal combustion residuals are managed at BRF in accordance with the CCR Rule, TDEC Consent Order and all other applicable laws and regulations. The NEPA reviews described in Section 1.3 of the Final EA describe actions related to CCR management at BRF. If the proposed action in the Bull Run Fossil Plant Landfill Final EIS is changed as a result of the deconstruction and demolition activities at BRF, additional NEPA reviews would be conducted.

Under the retirement alternative, TVA proposes a minimal closure plan consisting only of "monitoring, assessment, corrective action programs, or other actions deemed appropriate as specified" in the Environmental Investigation Plan. The EA should address the option to return the site to its original state or to replace current structures with renewable power generation (e.g., solar panels) to eliminate the need for monitoring. ***Jeanette Berry***

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If TVA decides to retire BRF, the subsequent use of the site will be addressed in a future planning process that will include public and agency input. TVA acknowledges that the site may be attractive for future economic development, including energy-related use.

NEPA Compliance

In the event that TVA retires Bull Run and construction of an on-site landfill is necessitated to support closure-by-removal, TVA's recent EIS on the proposed on-site landfill would not adequately describe the impacts of the landfill since a different landfill design would be necessary due to different waste quantities and other factors. The Final EA should state if additional NEPA review would be required for a post-retirement, closure-by-removal landfill. ***Kendra Abkowitz – TDEC***

TVA Response: Comment noted. This EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF. If the need for a post-retirement landfill that substantially differs from the landfill evaluated in the recent EIS, including a closure-by-removal landfill, is identified, TVA will conduct the necessary additional NEPA review for any such changes.

The cumulative impacts analysis in the DEA does not include the foreseeable action of dismantling the plant. The general impacts of this action are known and should be described. ***Ellen Smith; Dick Roop; Jeanette Berry***

TVA Response: Section 3.12.3 of the Final EA has been updated to reference the potential deconstruction and demolition of BRF. If TVA decides to retire BRF, the subsequent use of the site, including potential demolition of existing facilities and structures, would be evaluated in a future NEPA review.

Because the retirement decision is strongly linked to public health and the environment, as well as economics, TVA should hold a public hearing on it. ***Jeanette Berry***

TVA Response: The public comment period has provided a sufficient opportunity for TVA to obtain meaningful public input on key issues for the project, including health, environment, and economics. TVA is not proposing to hold a public hearing at this time.

Environmental Impacts

The proposal to leave the physical infrastructure in place following retirement would result in the continued degraded scenic quality of the highly utilized adjacent Haw Ridge Park, Claxton Community Park, and Melton Lake Park, as well as of the surrounding area, would remain unchanged. ***Jeanette Berry; Matthew D. Gunnell***

TVA Response: Comment noted. The EA acknowledges that the main change to the area's scenic quality resulting from the retirement, with the physical infrastructure in place, would be the elimination of the steam plume, the coal pile, and most activity, including vehicle traffic, on the plant site. Since the primary features in the visual environment (BRF stacks, dry fly ash stack and transmission lines) would remain in place, the overall scenic value class would remain the same. If TVA decides to retire BRF, TVA would evaluate the post-retirement use of the site, including the potential deconstruction and demolition of the physical infrastructure and subsequent redevelopment, in a future planning process with public input. This evaluation would include an assessment of visual resources and recreational impacts.

Available scientific literature indicates that CCR contains radionuclides. The only radionuclide listed in DEA Table 4 is radium. Justify why TVA and TDEC do not plan to sample other radionuclides. ***Jeanette Berry***

TVA Response: The analyte list for these environmental investigations (in Table 3-4) is based on the lists EPA published as Appendices III and IV to the CCR Rule, plus any additional analytes required by TDEC or that TVA believes would be useful in helping interpret results. EPA's lists are based on a comprehensive review that occurred over about a multi-year period and involved opportunities for public comment. On the basis of this extensive review, the only radionuclides EPA included in those lists were radium-226 and radium-228. TVA relied in part on this study to identify the radionuclides to be investigated.

The sampling results from existing monitoring wells should be made available to the public. This data would help characterize the current extent of contamination and highlight the importance of a comprehensive Environmental Investigation Plan. ***Jeanette Berry***

TVA Response: Existing data from State and CCR Rule groundwater monitoring is available on public websites. Open records requests can be submitted to TDEC to obtain the information.

Bull Run should be retired because of the air pollution, greenhouse gases, and toxic coal waste it produces. ***Leo York; Gene Burr; Gerard De Grandis; William Dean; Sam Dornan; Matthew D. Gunnell; Jerry Lichtenwalter***

TVA Response: Comment noted.

Alternative B will result in long-term beneficial impacts on water resources such as the Clinch River and the Melton Hill fishery. *Larry Gissentanna – EPA*

TVA Response: Comment noted. These beneficial impacts are described in Section 3.4 of the EA.

The DEA does not adequately describe the effects of the continued operation of Bull Run on aquatic ecology resulting from the impingement and entrainment of fish and other aquatic organisms and from the discharge of cooling water. TVA studies indicate an average of over 100,000 fish are impinged and millions of fish eggs and larvae are entrained each year. Retirement would prevent the premature death of millions of fish and shellfish. Bull Run also discharges half a billion gallons water that has been heated an average of 10.6 degrees Celsius, more than 80 terajoules of energy, each day it operates. *Christina Reichert and Amanda Garcia – SELC; Zachary Fabish – Sierra Club, and Stephanie Kodish – NPCA*

TVA Response: Section 3.4 of the Final EA has been revised to provide a more detailed description of the effects of Bull Run Fossil Plant on aquatic ecology resulting from impingement and entrainment of fish and other aquatic organisms.

The closure of Bull Run would result in a major negative financial impact to Anderson County and to the plant employees. It would also result in a negative symbolic impact due to the plant's physical size, importance, location, and historical significance. *Terry Frank – Anderson County Mayor, and Tracy Wandell – Anderson County Commission Chairman*

TVA Response: Comment noted. The EA evaluates the potential environmental and socioeconomic impacts of the proposed retirement of BRF.

SR 170, which runs adjacent to the Bull Run plant, is a critical segment of roadway. Significant road improvements are anticipated in this area and are dependent on right-of-ways at the plant. The transportation issues should be prioritized in the regional Transportation Improvement Plan. The cumulative impacts of roadway improvements should be addressed in the Final EA. *Warren Gooch – Oak Ridge Mayor; Terry Frank – Anderson County Mayor, and Tracy Wandell – Anderson County Commission Chairman*

TVA Response: Section 3.12.3 of the Final EA has been revised to include the cumulative impacts resulting from the proposed improvements to SR 170 in the vicinity of the Bull Run Fossil Plant. TVA will cooperate with the Tennessee Department of Transportation and local authorities to determine the need for and availability of any rights-of-way at Bull Run.

The DEA does not adequately describe the large and extensive environmental benefits to air quality that would result from retiring Bull Run. These include the under-assessment of the significance of the reductions in emissions of air pollutants, resulting in the DEA's conclusion of only "minor" improvements in air quality. NOx emissions are a particular

concern due to the numerous hours, largely during startup and shutdown when NOx emission rates were double to quintuple the annual average emission rate. These spikes in NOx emissions, partially addressed through the 8-hour NAAQS for ozone, would likely increase if Bull Run continues to operate and is subject to more frequent startup and shutdown. Bull Run NOx emissions data for 2009-2017 shows a large increase in NOx emissions in 2017 despite low generation compared to previous years. ***Zachary Fabish – Sierra Club; Stephanie Kodish – NPCA; Sadie McElrath***

TVA Response: BRF total annual NO_x emissions in 2017 were approximately 1,300 tons. This is only a little over 0.5% of the total statewide NO_x emissions, from all sources, of 234,000 tons in 2017. The average BRF emissions over the 2009-2017 period (after implementation of year-round operation of the selective catalytic reduction system) were approximately 1,000 tons/year, or less than 0.5% of the 2017 statewide NO_x total emissions. NO_x emissions are primarily a concern due to regional effects on $PM_{2.5}$ and ozone concentrations at large distances downwind of a facility (e.g., with respect to Tennessee statewide NO_x emissions, impact concerns might be in the northeastern U.S., for example). The higher NO_x emissions during startup (shutdown is usually not an issue) are due to the need to warm up the catalysts before they reach design efficiency. Given the small proportion of statewide emissions represented by BRF, even during startup conditions, the air quality benefits of avoiding the startup emissions cannot be characterized as "large and extensive." The EA, however, recognizes the beneficial impacts from reduction in TVA's system-wide emissions of SO_2 (1 percent), NO_x (1.6 percent), mercury (3 percent) and CO_2 (1.2 percent) as a result of the BRF retirement over the decade following retirement.

The statements in Table 2-2 that beneficial impacts to air quality and groundwater are "minor" needs more explanation. Are they "minor" on a county, regional, or global level? ***Jeanette Berry***

TVA Response: The anticipated changes in TVA system-wide emissions of air pollutants following the proposed retirement are quantified in Section 3.1.2.2. The local air quality benefits would be minor because the local area of the plant meets all NAAQS with the plant in operation. Therefore, shutdown of the plant would not eliminate any adverse impacts. Regionally, the air quality impacts of plant operation are minimal, given it represents a very small fraction of total regional emissions. Globally, the air quality impacts of BRF operation are miniscule. Similarly, the minor beneficial impacts to groundwater associated with Alternative B would be on a local level. The EA, however, recognizes TVA's system-wide reduction of air pollutants as a result of the BRF retirement.

The DEA does not adequately address the environmental benefits that would result from the reduction in CO_2 emissions if Bull Run is retired. Using the pre-2017 social cost of carbon of $42/ton, Bull Run emissions cause at least $116 million of harm each year. The resulting climate change impacts are described in detail in the 2018 Fourth National Climate Assessment. The DEA should more fully assess the benefits of the greenhouse gas reductions that would result from retirement. ***Zachary Fabish – Sierra Club, and Stephanie Kodish – NPCA; John Todd Waterman***

TVA Response: The social cost of carbon (SCC) metric is controversial and is affected greatly by economic assumptions. Therefore, TVA is not using the SCC metric in the EA as a basis for quantifying costs associated with the alternative of continued facility operation. The EA does recognize TVA's system-wide reduction in CO_2 emissions (1.2 percent) as a result of the BRF retirement.

The NAAQS data in Table 3-1 should be updated to include only the current NAAQS value for lead, which is 0.15 µg/m3 assessed on a rolling 3-month averaging time. The quarterly standard of 1.5 µg/m3 was abolished in Tennessee by EPA when the new standard became final. Kendra Abkowitz – TDEC

TVA Response: Table 3-1 has been revised as requested.

The ambient air quality data in Table 3-2 of the DEA includes $PM_{2.5}$ data from a Chattanooga site. We recommend that the Final EA include $PM_{2.5}$ data from the monitoring sites in Blount, Knox, Loudon or Roane counties, considerably closer to Bull Run than Chattanooga. We also recommend that the Final EA include SO_2 monitoring data from Freels Bend to (1) measure ambient SO_2 emissions from the area surrounding BRF and (2) meet the population weighted emissions index (PWEI) monitoring requirements for SO_2 associated with the Knoxville core-based statistical area (CBSA) population. ***Kendra Abkowitz – TDEC***

TVA Response: As stated in the EA, the summarized $PM_{2.5}$ monitoring data are from a site just west of Knoxville, less than 10 miles from BRF. No $PM_{2.5}$ data presented are for monitoring sites in Chattanooga. The EA summarizes local monitoring data for the pollutants of greatest concern (O_3 and $PM_{2.5}$), based on measured levels in comparison to the NAAQS. The past 3 years (2015-2017) of complete SO2 monitoring data for Freels Bend show concentrations that are less than 10 percent of the NAAQS, and given the SO_2 scrubber on BRF, facility operation is not expected to have significant effects on local SO_2 levels.

If TVA decides to retire Bull Run, the current NPDES Discharge Permit (TN0005410) would require modification as the discharge to outfall 002 from large volumes of cooling water cease. Modifications to the Multi-Sector General Stormwater Permit's Storm Water Pollution Prevention Plan (SWPPP) would need to occur to reflect the closure changes as well. An Aquatic Resources Alteration Permit could be necessary if there will be any alterations to wet weather conveyances, streams, wetlands, or other aquatic resources. These should be addressed in the Final EA. ***Kendra Abkowitz – TDEC***

TVA Response: Section 1.6 of the EA states that TVA would seek amendment to the NPDES Discharge Permit (TN0005410). The Final EA has been revised to add future modifications to the Multi-Sector General Stormwater Permit's SWPPP. An Aquatic Resources Alteration Permit (ARAP) is not needed for the proposed action to retire the plant. If TVA decides to retire the plant, actions associated with deconstruction and demolition of BRF and the subsequent use of the site would be addressed in a future NEPA review. The need for an ARAP would be assessed at that time.

Other Topics

I strongly support closing the Bull Run plant. It emits significant quantities of carbon, the impacts of which were recently documented in the 2018 Fourth National Climate Assessment. The recent State of the Carbon Cycle Report documents that reduced energy emissions can be achieved by fuel switching to renewables and natural gas while GDP continues to increase. The energy generated by it should be replaced, if necessary, by renewables and/or low carbon emitting technologies. ***Melanie Mayes; Anne Ercelawn; John Todd Waterman; Dick Roop; Gene Burr; Sadie McElrath***

TVA Response: Comment noted. The anticipated sources of the replacement energy, following the retirement of BRF, are described in Section 3.1.2.2 of the EA. They include renewable and natural gas-fueled generation. The anticipated change in carbon emissions is also described in Section 3.1.2.2.

We support the retirement of Paradise and Bull Run. Coal is increasingly less economically viable and has too many risks. The DEAs confirm that the TVA power supply will remain secure and reliable following the retirements, which will also save TVA customers money and reduce air, water, and coal ash pollution and carbon emissions. The retirements should be accompanied by a just transition to TVA employees and the surrounding communities as TVA moves to clean, reliable, low-cost energy. ***675 Sierra Club Members; John Todd Waterman; Axel C. Ringe, Tennessee Chapter Sierra Club; Daniel Joranko; Jerry Lichtenwalter; JoAnn McIntosh***

TVA Response: Comment noted. If TVA decides to retire BRF, TVA would help provide a just transition to TVA employees and the surrounding communities by placing some interested employees in available positions across the TVA power service area.

Early in its history, TVA promised cheap electricity for life. Instead, TVA sells electricity generated by hydroelectric dams to other states at below market prices and pollutes the Valley by burning coal. ***The Federal Farmer***

TVA Response: Comment noted. TVA is assessing the continuing cost of operating BRF against the demand projections and TVA's statutory mission to provide reliable power at the lowest system cost.

The use of once-through cooling water is inefficient and an unwise use of natural resources. This inefficiency is another reason why BRF should be shut down. ***Jeanette Berry***

TVA Response: Comment noted.

We support the retirement of BRF. ***Sandra Goss – Tennessee Citizens for Wilderness Planning***

TVA Response: Comment noted.

For the reasons described in the DEA, we concur that the retirement of Bull Run is a prudent alternative. From an energy assurance standpoint, TVA has the ability to provide baseload and surge capacity electricity while fulfilling its statutory mission to provide reliable power at the lowest system cost. ***Kendra Abkowitz – TDEC***

TVA Response: Comment noted.

The proposed CCR landfill expansion onto pristine land is unacceptable. ***Jeanette Berry***

TVA Response: Comment noted. Impacts associated with the BRF landfill are not part of the proposed action and are assessed under *Bull Run Fossil Plant Landfill Final Environmental Impact Statement* (TVA 2016).

Bull Run should be retired because of the environmental consequences of its continued operation and the many benefits of retirement described in the DEA. ***Christina Reichert and Amanda Garcia – SELC; Zachary Fabish – Sierra Club, and Stephanie Kodish – NPCA***

TVA Response: Comment noted.

Commenters:

Abkowitz, Kendra, Tennessee Department of Environment and Conservation
Berry, Jeanette
Burr, Gene, Scenic Tennessee
De Grandis, Gerard
Dean, William
Dornan, Sam
Ercelawn, Anne
Fabish, Zachary, Sierra Club
Frank, Terry, Mayor, Anderson County
Gissentanna, Larry, Environmental Protection Agency
Gooch, Warren, Mayor, City of Oak Ridge
Goss, Sandra, Tennessee Citizens for Wilderness Planning
Gunnell, Matt
Johnson John
Joranko, Daniel, Tennessee Interfaith Power and Light
Kennedy, Robert, Environmental Quality Advisory Board, Oak Ridge
Kodish, Stephanie, National Parks and Conservation Association
Lichtenwalter, Jerry
Logan, Joanne
Mayes, Melanie
McElrath, Sadie
McIntosh, JoAnn
Mulig, Ron
Munro, Nancy
Olsen, Catherine
Ozegovich, Joe
Parrish, Ryan
Reichert, Christina, and Amanda Garcia, Southern Environmental Law Center
Ringe, Axel, Tennessee Chapter Sierra Club
Roop, Dick
Shober, Maggie, Southern Alliance for Clean Energy
Smith, Ellen
Stephens, Hal
The Federal Farmer
Wandell, Tracy, Chairman, Anderson County Commission
Waterman, John Todd
Wiest, Mick
Yager, Ken, Tennessee State Senate
York, Leo

B

Comments on the Draft EA Received during the Public Comment Period

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STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

SHARI MEGHREBLIAN, PhD
COMMISSIONER

BILL HASLAM
GOVERNOR

December 19, 2018

Via Electronic Mail to aapilakowski@tva.gov
Attn: Ashley Pilakowski, NEPA Specialist
Tennessee Valley Authority
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902

Dear Ms. Pilakowski:

The Tennessee Department of Environment and Conservation (TDEC) appreciates the opportunity to provide comments on the Tennessee Valley Authority (TVA) *Potential Retirement of Bull Run Fossil (BRF) Plant Draft Environmental Assessment* (EA) which assesses the site-specific impacts of the potential retirement of BRF in Anderson County, Tennessee. Given the energy environment projected over the next several years, where zero to declining demand combines with higher load swings and calls for more renewable energy resources, TVA must continuously evaluate all generating assets to ensure portfolio flexibility and fiscal responsibility to the people of the Valley.[1] Assets that have relatively high projected future maintenance cost and environmental compliance expenditures, high forced outage rates and poor generation portfolio fit, are now the focus of more detailed study for potential retirement. TVA's BRF falls into this category of assets.

Actions considered in detail within the Draft EA include:

> **Alternative A – No Action Alternative**. Under the No Action Alternative, the BRF unit would not be retired and would continue to be part of TVA's generation portfolio. Under this alternative, as well as under Alternative B, TVA would implement several actions related to coal combustion residuals (CCR) management, including various impoundment closures.[2] In order to continue operating BRF, TVA would

[1] Comprehensive analysis, including the NEPA evaluation for the potential retirement of BRF, will inform the TVA Board as TVA plans its future power supply.

[2] Table 2-1 and Section 2.1.1 describe the Alternative specific CCR actions that TVA will take. TVA will take the following actions relating to CCR under both scenarios:

- **Environmental Investigation Plan (EIP).** Per TDEC Consent Order No. OGC15-0177, TVA is developing an EIP for BRF to set forth a "process for the investigation, assessment, and remediation of unacceptable risks" at BRF coal ash disposal sites. This includes gathering existing CCR data, conducting sampling, developing analysis plans, and revising the EIP to address TDEC and public comments.
- **Bottom Ash Complex Final Closure.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require closure of the Bottom Ash Complex at BRF. Associated actions include dewatering impoundments, rerouting storm water and wastewater conveyances, grading and reconfiguring the stored bottom ash, transferring 250,000 cubic yards of borrow material to grade and cover the site, and installing protective covers (TVA 2016b).
- **Gypsum Impoundment Final Closure.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require closure of the Gypsum Impoundment at BRF (TVA 2016b).
- **Partial Fly Ash Impoundment Closure.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require repurposing of a portion of the Fly Ash Impoundment and Stilling Pond at BRF for use as a non-CCR

construct a new CCR landfill over the next 6 years.[3] TVA would also implement projects associated with the waste water treatment facility, bottom ash overflow optimization and underflow piping, sulfite analyzers, and outage wash collection system.[4]

Alternative B – Potential Retirement of Bull Run Fossil Plant.[5] Under Alternative B, TVA would retire BRF in 2023. At that time, TVA would cease most plant operations and reduce plant staff. In order to minimize environmental and safety risks and comply with applicable laws and regulations, TVA would implement the following actions.

1. Decommissioning is the performance of activities required to ready a facility for deactivation. Work performed includes removal of equipment, components, and parts that can be used at other sites, draining of oil/fluids from equipment, removal of coal and ash from boilers and other equipment, removal of hazardous materials and potential waste like materials, removal of polychlorinated biphenyls (PCBs) equipment, removal of furniture/furnishings, removal of information technology assets, and removal of plant records. Key activities include:

    - Tagging out all unit or plant equipment except service water, lighting, etc.
    - Emptying and cleaning hoppers, bins, bunkers, etc.
    - Opening all equipment electrical breakers not in use
    - Draining oil and fluids
    - Salvaging and storing all useable equipment, components, materials, spare parts, office products etc. and relocating them, as practical
    - Salvaging and storing all key plant records.

2. Deactivation is shutting down of power and energized systems as appropriate as well as isolating and/or severing power, water and piping to the plant to provide a cold, dark and dry structure. Work includes removing power and services, installing bulkheads, and sealing tunnels. Activities may also include rerouting of power and services as required for any facilities that would remain operational. Key activities include:

    - Performing electrical and mechanical isolation of systems, components and areas
    - Installing bulkheads and/or fill tunnels
    - Providing alternate power and services (sump pumps, Federal Aviation Administration (FAA) stack lighting, etc.)

Process Water Basin. Associated actions include temporarily covering 20 acres of the Fly Ash Impoundment, closing the remaining 13 acres, and repurposing the closed portion as a Process Water Basin for BRF. The Stilling Pond would be closed-by-removal and repurposed as a separate Process Water Basin. These basins would only manage storm water and non-CCR wastewater from BRF facilities (TVA 2017a; TVA 2018).

- **Process Water Basins.** TVA's goal of converting all wet fly ash, bottom ash, and gypsum operations to dry storage at its coal plants would require closure of the Process Water Basins at BRF as described under the Partial Fly Ash Impoundment Closure (TVA 2017a; TVA 2018).

[3] The 120-acre landfill would be located about 0.4 miles east of BRF and would provide approximately 15 years of CCR disposal capacity. Associated actions include the construction of a haul road, perimeter roads, and sediment ponds. The construction and operation of the new landfill, along with its potential environmental impacts, are described in detail in TVA 2016a.

[4] Details regarding these projects, including analyses of their potential environmental impacts, have not been finalized. The projects discussed in this paragraph would not be completed if the decision is made to retire BRF. If a decision is made to continue operating BRF and additional details are available, the analyses of these projects would be completed.

[5] Under Alternative B, TVA would implement several CCR-related actions listed in Table 2.a and described in Section 2.1.1. If BRF were retired in 2023, the Stilling Pond Closure would be completed over the next 6 years. If the completion of the TDEC Consent Order results in the need for TVA to close its existing impoundments at BRF by removal, then the landfill, haul road and bridge may still need to be constructed.

3. Limited decontamination involves removing select regulated materials in a safe and practical manner in such a way that the plant is left in a status that does not present a hazard or risk to the environment or personnel. Limited decontamination activities at BRF includes abatement and disposal of regulated materials, which include but are not limited to PCB equipment, asbestos, hazardous waste, solid waste, products, etc. Key activities include:

    - Removal and proper disposal of regulated materials as practical
    - Periodic materials condition monitoring.
    - Periodic waste removal as materials deteriorate over time.

TDEC has reviewed the Draft EA and has the following comments regarding the proposed action and its alternative:

Cultural and Natural Resources

TDEC believes the Draft EA adequately addresses potential impacts to cultural and natural resources within the proposed project area.[6]

Energy Programs

TDEC concurs that when considering a number of factors, including but not limited to the Valley's flat-to-declining load projections, cheaper fuel options, and the cost of capital improvements that would be required to continue site operations that are environmentally compliant, retirement of BRF seems like a prudent alternative. From an energy assurance standpoint, TDEC does not have any concerns with TVA's ability to continue to provide electricity – both baseload and surge capacity — while fulfilling its statutory mission to provide reliable power at the lowest system cost.

TDEC recommends that consideration be given to using alternative-fueled and/or electric-powered equipment where possible as noise levels and air emissions would be lower than traditional gas-powered models. For instance, electric-powered lawn equipment is as much as fifty percent (50 %) quieter than traditional gas-operated models. Electric-powered Lawn equipment has zero air emissions onsite, reduces petroleum-fuel purchases, and eliminates used oil waste.

Air Resources

The Draft EA discusses developing a plan for managing asbestos once demolition activities are determined. However, there is no mention of analysis or research associated with proactively identifying the presence of asbestos containing material. TDEC recommends that Final EA include discussion on how TVA will identify asbestos containing material in advance of planning for the management of asbestos removal.

TDEC recommends that the National Ambient Air Quality Standards (NAAQS) data included in Table 3-1 (provided on page 14) be updated to include only the current NAAQS value for lead, which is 0.15 $\mu g/m^3$ assessed on a rolling 3-month averaging time.[7]

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[6] This is a state-level review only and cannot be substituted for a federal agency Section 106 review/response. Additionally, a court order from Chancery Court must be obtained prior to the removal of any human graves. 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).

[7] The quarterly standard of 1.5 $\mu g/m^3$ was abolished in Tennessee by EPA when the new standard became final. The old standard is no longer in force and is not used for designation purposes.

The ambient air quality data presented in Table 3-2 (provided on page 15), includes PM2.5 data from a site in Chattanooga (47-093-0028, the 911 Siskin Drive site located in Hamilton County), which is relatively far away from BRF. The ozone data presented appears to be from the Freel's Bend site (47-001-0101, located in Anderson County), which is reasonable given that the site is in close proximity to BRF which is also located in Anderson County. There are other PM2.5 monitoring sites located in Blount County, Knox Loudon and Roane counties that are all considerably closer to BRF than the Chattanooga site selected. TDEC recommends TVA consider including monitoring sites with closer proximity to BRF in the analysis provided by the Final EA.

TDEC recommends that SO2 monitoring data collected at the Freel's Bend site be included in the Final EA. SO2 monitoring occurs at the Freel's Bend site to (1) measure ambient SO2 emissions from the area surrounding BRF and (2) meet the population weighted emissions index (PWEI) monitoring requirements for SO2 associated with the Knoxville core-based statistical area (CBSA) population.[8] TDEC recommends that TVA include these considerations in the Final EA.

Remediation

Based on review of the Draft EA, TDEC does not anticipate direct impacts to biological monitoring for the Department of Energy's Oak Ridge Reservation (ORR) or potential impacts on heavy metals and radiological monitoring. In the event of an unforeseen breech, poor erosion control, or disturbance of CCR materials, as well as the associated sediments and water, there could potentially be a detectable increase in metals such as arsenic, mercury, chromium, etc. downstream in the Clinch River at the ORR. Changes in pH associated with CCR could also cause the release of some metals. The potential release of uranium and its daughter products from CCR could be detected at low levels with direct monitoring for uranium and with gross alpha/beta monitoring in the Clinch River at the ORR. TDEC recommends that TVA include a notification protocol in the Final EA to alert ORR in the event of an unplanned release of material.

Solid Waste

In the event that TVA moves forward with Alternative B, retirement of BRF, and construction of an onsite landfill is necessitated to support closure-by-removal, previous analysis associated with the proposed landfill will not be reflective of this scenario. The original NEPA document for the proposed onsite landfill (Site J) stated an objective/need of twenty years of disposal capacity for ongoing production of CCR waste.[9] An evaluation of environmental onsite impacts were weighed against cost and impacts for offsite disposal at Chestnut Ridge landfill. It is reasonable to assume that the quantity of waste resulting from closure-by-removal would be less than the quantity from twenty years of waste generated by ongoing operations. Therefore, the onsite impacts for the original NEPA document would not be appropriate. A landfill design for the quantity waste resulting from closure-by removal would be very different from the currently proposed landfill design. TDEC recommends that TVA state if additional NEPA review would be required for the scenario where TVA is required to closure-by-removal any of the CCR units at BRF in the Final EA.

[8] The PWEI is an EPA requirement that provides the number of SO2 monitors that are required to be operated based on an index number calculated using the SO2 emissions density in tons for the CBSA and the population of the CBSA. As the index rises the number of monitoring sites goes up. The Bull Run TVA facility has emissions that were great enough based on the Knoxville population (CBSA) to trigger the need for a single monitor that was located at our Freels Bend site in Anderson County.

[9] The original Environmental Impact Statement for the proposed onsite landfill can be found at, https://www.tva.gov/Environment/Environmental-Stewardship/Environmental-Reviews/Bull-Run-Fossil-Plant-Landfill-Management-of-Coal-Combustion-Residuals.

Water Resources

Based on review of the Draft EA, the proposed landfill construction will require a hydrologic determination study by a certified hydrologic professional to identify all of the aquatic resources within the project limits of disturbance to determine the impact to water resources. The construction of the landfill may require an Aquatic Resources Alteration Permit (ARAP), an National Pollutant Discharge Elimination System (NPDES) storm water construction permit, and/or an NPDES discharge permit. TDEC recommends the Final EA include these details.

Closure of BRF, as TVA notes, would require the current NPDES Discharge Permit (TN0005410) to remain as closure activities continue. However, this permit would require modification as the discharge to outfall 002 from large volumes of cooling water cease. Modifications to the Multi-Sector General Stormwater Permit's Storm Water Pollution Prevention Plan (SWPPP) would need to occur to reflect the closure changes as well. Depending on the specific closure activities chosen, an ARAP could be necessary if there will be any alterations to wet weather conveyances, streams, wetlands, or other aquatic resources. TDEC recommends TVA include these considerations in the Final EA.

It should be noted that TVA may choose to pursue CCR impoundment closure-in-place at any of its Fossil Plants. However, should TVA begin CCR surface impoundment closures at any of its Tennessee Fossil Plants and TDEC subsequently determines based on soil, surface water, ground water and/or geologic instability that closure in place is not protective of public health and/or the environment, then TDEC shall, in accordance with the Commissioner's Order, require TVA to commence appropriate corrective action including removal of CCR surface impoundments where TVA has begun or completed closure-in-place. Further, TVA is on notice that Tennessee Code Annotated Section 68-211-106(j) may require a permit or other approval from TDEC for the disposal or use of coal ash.

TDEC appreciates the opportunity to comment on this Draft EA. Please note that these comments are not indicative of approval or disapproval of the proposed action or its alternatives, nor should they be interpreted as an indication regarding future permitting decisions by TDEC. Please contact me should you have any questions regarding these comments.

Sincerely,

Kendra Abkowitz

Kendra Abkowitz, PhD
Assistant Commissioner, Office of Policy and Sustainable Practices
Tennessee Department of Environment and Conservation
[redacted]

cc: Daniel Brock, TDEC, DOA
Molly Cripps, TDEC, OEP
Lacey Hardin, TDEC, APC
Chuck Head, TDEC, BOE
Lisa Hughey, TDEC, DSWM
Tom Moss, TDEC, DWR
Joseph Sanders, TDEC, OGC
Robert Wilkinson, TDEC, BOE
Stephanie Williams, TDEC, DNA

SOUTHERN ENVIRONMENTAL LAW CENTER

December 18, 2018

DELIVERED VIA U.S. MAIL, WEB,[1] *and EMAIL (aapilakowski@tva.gov)*

Ashley Pilakowski
NEPA Compliance
Tennessee Valley Authority
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902

RE: Potential Bull Run Fossil Plant Retirement Environmental Assessment

Dear Ms. Pilakowski:

Thank you for the opportunity to comment on the Draft Potential Bull Run Fossil Plant Retirement Environmental Assessment (the Draft Assessment).[2] The fifty-one year old Bull Run Fossil Plant (Bull Run or the plant) began operation in 1967 near Clinton, Tennessee in Anderson County at the convergence of the Clinch River and Bull Run Creek.[3] It is a single-boiler supercritical coal-fired power plant with a nameplate capacity of 950 megawatts.[4] The Southern Environmental Law Center encourages retirement of Bull Run because of the environmental consequences associated with continuing to run the plant and the many benefits of its retirement identified in the Draft Assessment.

We write to highlight one additional effect of continuing to operate the plant that was not adequately considered by the Tennessee Valley Authority (TVA) in the Draft Assessment: the annual impingement of thousands of fish and entrainment of millions of fish eggs and larvae. To operate, Bull Run depends on millions of gallons of water drawn from the upstream Clinch River. That water—which contains thousands of aquatic species and their offspring—is pulled

[1] http://www.tvanepacomments.com/comments.cfm?pid=wgse7f6prddafsddwbtblg0pe5asn30wa88tk9aquwwmd82gae.

[2] Tenn. Valley Auth., Draft Potential Bull Run Fossil Plant Retirement Environmental Assessment (Nov. 2018), https://www.tva.com/Environment/Environmental-Stewardship/Environmental-Reviews/Potential-Retirement-of-Bull-Run-Fossil-Plant [hereinafter "Draft Assessment"].

[3] *See* TVA, *Bull Run Fossil Plant*, https://www.tva.gov/Energy/Our-Power-System/Coal/Bull-Run-Fossil-Plant (last visited Jan. 26, 2018).

[4] *Id.*

from the upstream Clinch River, through an intake channel, over a skimmer wall, between the bars of trash racks, and through vertical traveling screens.[5] Aquatic species, primarily fish, larvae, and eggs, are pulled towards the intake channel for Bull Run and are either pinned against the trash racks or vertical traveling screens (impingement) or forced through the cooling intake system (entrainment).[6]

I. TVA must take a hard look at the effects of impingement and entrainment at Bull Run.

Prior to finalizing the Draft Assessment, TVA must take a "hard look"[7] at the environmental consequences of this project and ensure that its decision accomplishes the goal of the National Environmental Policy Act "to promote efforts which will prevent or eliminate damage to the environment and biosphere."[8] This hard look requires consideration of each alternative's effects on aquatic ecology. TVA's Draft Assessment fails to consider the fish, larvae, and eggs that are currently being wrenched towards the plant's cooling water intake channel and meeting one of two fates: (1) being pinned against racks or screens or (2) being sucked through the system that cools the plant.[9] While superficially acknowledging the benefits of eliminating impingement and entrainment in its section on "Surface Water,"[10] TVA ignores impingement and entrainment in its section on the "Aquatic Ecology." This omission must be remedied.

If fish are impinged, they generally die, although some may survive after wresting themselves free of the racks and screens, swimming against the current of the intake channel, and finally returning to the upstream Clinch River, hopefully with enough energy to swim on and

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[5] Att. 1, Tenn. Valley Auth., *Bull Run Fossil Plant NPDES Permit No. TN0005410—316(b) Monitoring Program: Fish Impingement at Bull Run Fossil Plant During 2005 through 2007* 1–2 (2007) [hereinafter "TVA Impingement Study"].

[6] *Id.* at 1–2.

[7] 42 U.S.C. § 4332(2)(C); *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 374 (1989).

[8] 42 U.S.C § 4321.

[9] TVA Impingement Study, at 1–2.

[10] "The elimination of withdrawals of cooling water as a result of cessation of coal-burning operations would reduce impingement and entrainment impacts, and have other beneficial impacts from reduced water consumption." Draft Assessment, at 24.

avoid predators.[11] The majority of impinged fish die.[12] TVA has studied fish impingement,[13] and it found that for each year of the two-year study, over 100,000 fish were impinged on average.[14] (Table 1). Assuming roughly consistent results each year, Bull Run could have impinged between 4 and 5.4 million fish over its operating lifetime.[15] Retiring Bull Run would end the need for cooling water, therefore ceasing fish impingement. That effect deserves a "hard look."[16]

Table 1. Fish impinged per year at Bull Run as reported in TVA Impingement Studies.[17]

	1974–1975*	2005–2006	2006–2007
Fish Annually Impinged (Extrapolated)	26,976 fish	56,042 fish	156,730 fish

* Intake velocity recorded during this study ranged to 0.1–1.8 fps, as compared to the current rate of 3.3 fps

Similarly, Bull Run entrains millions of fish, fish eggs, fish larvae, and shellfish each year. Creatures small enough to be squeezed between the racks and screens at Bull Run's intake pipes speed directly to steam condensers[18] and then suffer their surrounding environment increase in temperature by an average of 10.6° Celsius (51.08° Fahrenheit).[19] TVA has studied fish entrainment, and for each year of the two-year study, TVA estimated that millions of fish eggs and larvae were entrained, and are presumed to have died.[20] (Table 2). Because retirement would end this entrainment, TVA must consider the impacts of continuing to operate the plant and the benefits of preventing the premature death of millions of fish and shellfish.

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[11] Escape might also occur, for example, when the trash racks or traveling screens are washed, releasing living (but mostly dead) fish along with other debris into a sluice trench that empties into a concrete pipe. TVA Impingement Study, at 1–2.

[12] *Id.* at 3.

[13] *Id.* TVA also studied impingement after the Clean Water Act was first implemented. Att. 2, Tenn. Valley Auth., *Impingement at Bull Run Steam Plant* 2–3, 6 (1975).

[14] TVA Impingement Study, at 4, 9.

[15] 2018-1967 = 51 years x approx. 106,386 fish/year on average 2005–2007 = approx. 5,425,686 dead fish. 51 years x approx. 79,916 fish on average across all studies = 4,075,716.

[16] *Marsh*, 490 U.S. at 374.

[17] TVA Impingement Study, at 9.

[18] *Id.* at 1.

[19] Att. 3, Tenn. Valley Auth., *Estimates of Entrainment of Fish Eggs and Larvae by Bull Run Steam Plant, 1975, and Assessment of the Impact on the Fish Populations of Melton Hill Reservoir* 24 (June 1976).

[20] Att. 4, Tenn. Valley Auth., *§ 122.21(r)(9) Entrainment Characterization Study for the Bull Run Fossil Plant* 6, 21 (2017).

Table 2. Fish entrained per year at Bull Run as reported in TVA Entrainment Studies.[21]

	2013–2014*	2014–2015
Fish Eggs Entrained (annually extrapolated)	2,703,075	7,755,883
Fish Larvae Entrained (annually extrapolated)	9,732,079	478,206,907

* Bull Run "did not operate during entire sample weeks from March [20]13–14 through August [20]13–14."[22]

CONCLUSION

Before taking action, TVA must take a "hard look" at the environmental consequences of Bull Run's continued operation and its retirement, and it has failed to do so in the Draft Assessment. To ensure compliance with the National Environmental Policy Act and to appropriately evaluate all of the benefits of Bull Run's retirement and costs of Bull Run's continued operation, we ask that TVA consider the environmental consequences of impingement and entrainment at Bull Run.

Because of *all* of the environmental benefits associated with ceasing operations of this fifty-one year-old coal plant, we support the retirement of Bull Run.

Sincerely,

Christina I. Reichert
Amanda Garcia
Southern Environmental Law Center

Attachments provided via ShareFile: https://southernenvironment.sharefile.com/d-sbf8d341e026495fb

[21] *Id.* at 58–59, tbl.8.

[22] *Id*. at 17.

ANDERSON COUNTY GOVERNMENT

TERRY FRANK
COUNTY MAYOR

December 18, 2018

Ms. Ashley Pilakowski
Tennessee Valley Authority
400 West Summit Hill Drive WT 11B
Knoxville, TN 37902

Via electronic mail: aapilakowski@tva.gov

RE: BULL RUN FOSSIL PLANT RETIREMENT
ENVIRONMENTAL ASSESSMENT: TVA Project 2018-35

Dear Ms. Pilakowski:

Anderson County appreciates the opportunity to comment on the Draft Potential Bull Run Fossil Plant Retirement Environmental Assessment: TVA Project 2018-35. The contents of the letter were considered by the Anderson County Board of Commissioners meeting in regular session on December 17, 2018. The Board of Commissioners voted to approve the transmittal of these comments.

The Bull Run Fossil Plant is located inside unincorporated Anderson County in the Claxton community. We are thankful and appreciative of the power TVA has provided the citizens of our community, county and region since Bull Run Fossil Plant came online in 1967. Because the facility is located in the Claxton Community, Anderson County is also appreciative of the community partnership with TVA that has enabled the community to provide additional services to its citizens.

Anderson County is fully aware of TVA's mission: *"to improve the quality of life in the Valley through the integrated management of the region's resources"* and serving *"the people of the Tennessee Valley by focusing on three key areas: energy, environment and economic development."*

Anderson County has been a vital and productive partner in helping TVA fulfill its mission.

[redacted]

The possible closure of the Bull Run Fossil Plant, known locally for generations as the Bull Run Steam Plant, would be a major negative impact to our county—not only financially to our citizens and the people employed at the plant, but also symbolically given the plant's physical size, importance, location and historical significance.

Anderson County understands that it makes sense for our ratepayers/users for TVA to evaluate the future costs of maintenance and environmental compliance; however, we wish to stress that an in-depth, no stone unturned review of energy needs in our community is critical to your assessment. Our county is a regional leader in manufacturing and also the home to the vital missions of Y-12 and also neighboring Roane County's ORNL facility. A core key to the success of these industries, and the missions of DOE and DOE related missions, is an uninterrupted power supply that has successfully been provided by TVA over the decades. We cannot stress enough that failure to properly score these needs could be detrimental and possibly economically crippling.

Anderson County conveys our desires to keep the Bull Run Fossil Plant open for the employees who work there, the economic benefits that being a host site provides to our citizens and the diversification of energy that it supplies in your generation mix.

Should your assessment and recommendation lead to closure, our priority is on the environmental protection of the area and neighboring community, and in keeping with TVA missions, the economic development of the site.

Please know that on August 15, 2016, the Anderson County Board of Commissioners voted to request the Tennessee Valley Authority to construct a natural gas combined cycle power plant on the Bull Run Property in an effort to decrease coal ash storage facilities and reduce the environmental footprint of the Bull Run Steam Plant. Anderson County believes this is a viable option.

If TVA does not support a generation asset on the site, we support quick, full decommissioning and redevelopment of this vital site. The acreage, the prime regional location, the access to rail, road and water makes the location ideal for major significant economic development and significant opportunity for partnership between the county and TVA.

As recently as 2012, TVA acquired an additional 155 acres, including over 20 residences in the Claxton area for its landfill expansion. Locally, that decision was unpopular given the removal of those properties from local taxation. While we do receive PILT for those properties, that value is capped at the value at time of acquisition and gives no opportunity for growth as our county values increase. In addition, while we know that TDEC is working with TVA on the expansion of coal ash storage, we want to make you aware that we do continue to receive negative comments of concern regarding the expansion of the coal ash landfill.

Anderson County agrees with the City of Oak Ridge that Alternative B, where the plant is closed and the equipment removed but its buildings and structures remain in place, is a

wholly unsupported option in that it removes an important economic resource and prevents its timely replacement.

Anderson County also agrees with comments by the City of Oak Ridge regarding major expansion and improvement of SR 170 between SR 9/US 25W and SR 62. The City importantly notes, "cumulative impacts of the closure must be accounted for in any assessment: financial impacts to local governments, sensible environmental remediation, roadway and ROW enhancements, railroad integration for industrial use, removal of facilities and an established timeline for implementation for completion. All transportation issues should be prioritized on the regional Transportation Improvement Plan (TIP)."

Anderson County is thankful for the opportunity to comment and hopeful that you will seriously consider the full economic and quality of life impacts to our county in your closure assessment. We have proven to be a strong partner with TVA where both our missions to improve quality of life in our community intersect. We hope to continue a relationship that improves the quality of life for people in Anderson County.

Sincerely,

Terry Frank
Anderson County Mayor

Tracy Wandell
Chairman, Anderson County Commission

cc: President Donald Trump
Lamar Alexander, United States Senator
Marsha Blackburn, United States Senator
Chuck Fleischmann, United States Congressman
Randy McNally, Lt. Governor
Ken Yager, State Senator
John Ragan, State Representative

[redacted]

CITY OF
OAK RIDGE

OFFICE OF THE MAYOR

[redacted]

[redacted]

December 18, 2018

VIA E-Mail: aapilakowski@tva.gov

Ms. Ashley Pilakowski
Tennessee Valley Authority
400 West Summit Hill Drive WT 11B
Knoxville, TN 37902

SUBJECT: DRAFT POTENTIAL BULL RUN FOSSIL PLANT RETIREMENT ENVIRONMENTAL ASSESSMENT: TVA Project 2018-35

Dear Ms. Pilakowski:

The City of Oak Ridge appreciates the opportunity to comment on the *Draft Potential Bull Run Fossil Plant Retirement Environmental Assessment: TVA Project 2018-35*. The contents of the letter were considered by the City Council on December 10, 2018 with that body voting to approve the transmittal of these comments.

The Bull Run Fossil Plant has provided reliable power to the citizens of the Tennessee Valley for over fifty years. It is a fixture to the citizens of Oak Ridge, both as a symbol of the commitment of Tennessee Valley Authority to provide low cost, reliable power to our community and maintaining strict compliance with safety and environmental policies that protect our region and its citizens.

We consider the possible loss of this resource to be of grave concern. At the most immediate level, the loss of 100 high paying jobs and the associated impacts on the transportation industry, tourism (through impact on the fisheries), and the multiplied effects of these economic input both to our City and to Anderson County, would appear much more consequential than indicated in the report.

The City Council understands that the operation or closure of a generation asset is a financial decision made in an effort to provide economical electric power. However, while we understand that the plant has moved from an 80% capacity factor to a 33% capacity factor, we are concerned that by considering elimination of the plant, TVA is moving *away* from its commitment to a diverse fuel mix and *toward* over dependence on natural gas. One can hardly recall TVA's own dire warnings of high load and appeals for conservation during both high and low temperature extremes over the last several years without questioning if elimination of a generation resource is, in fact, desirable from the perspective of a robust, reliable power system.

All of that said, perhaps the most troubling aspect of the proposal is the Alternative B, where the plant is closed and the equipment removed, but its buildings and structures remain in place. This scenario both unacceptably removes an important economic resource and prevents its timely replacement.

The Bull Run site of several hundred acres has access to rail, highway transportation and barge facilities. It has a ready supply of water for both consumption and cooling and is obviously positioned such that high levels of electric power is available. Experience at other industrial sites in Oak Ridge as part of Department of Energy (DOE) reindustrialization has demonstrated a strong need for the work to prepare a site such as the Bull Run plant for all services, levelling and soil stabilization. A consulting study for the

return of the site to private sector hands and a review of usage possibilities for the site should be coordinated with state agencies such as TDOT, TDEC and the U.S. Corps of Engineers. **Open and frequent inclusion of the City of Oak Ridge and Anderson County is a must!**

For such a site to be shut and left unusable, occupied by abandoned buildings, mountains of coal ash and rusting facilities is a waste and a significant change to TVA's commitment to the Valley and its surrounding communities.

Bull Run plant is located on a critical segment of roadway from Clinton Highway, through Claxton, crossing in to Oak Ridge on Edgemoor Road. Significant road improvements are anticipated through this corridor and said ROWs and dedications for bridge rebuilding must be participated in by TVA with grade separation from the adjacent railroad. These cumulative impacts of the closure must be accounted for in any assessment: financial impacts to local governments, sensible environmental remediation, roadway and ROW enhancements, railroad integration for industrial use, removal of facilities and an established timeline for implementation for completion. All transportation issues should be prioritized on the regional Transportation Improvement Plan (TIP).

Although it is our preference that Bull Run continue in its role as a productive employer and power resource, should the decision be made to permanently close the facility, the City of Oak Ridge strongly urges TVA to remove all abandoned structures, remove the coal ash to the degree possible and clear the land for industrial use.

Redevelopment of the site could eventually more than offset the economic damage to Oak Ridge and Anderson County that closing of the Plant will cause. It will make productive use of the resources of our region without the significant loss of agricultural or recreational lands and, most importantly, it will demonstrate TVA's true commitment to the wellbeing of our community.

Thank you for your consideration of these remarks and we look forward to being a part of the process as it moves forward.

Sincerely,

Warren L. Gooch
Mayor

cc: Lamar Alexander, United States Senator
Marsha Blackburn, United States Senator
Chuck Fleischmann, United States Congressman
Randy McNally, Lt. Governor
Ken Yager, State Senator
Kent Calfee, State Representative
John Ragan, State Representative

From:	Gissentanna, Larry
To:	Pilakowski, Ashley Anne
Cc:	Militscher, Chris; Buskey, Traci P.
Subject:	RE: TVA Draft Environmental Assessment for the Potential Bull Run Fossil Plant Retirement
Date:	Tuesday, December 18, 2018 10:15:11 AM

TVA External Message. Please use caution when opening.

Ashley Pilakowski
NEPA Compliance
Tennessee Valley Authority
400 W. Summit Hill Drive
Knoxville, TN 37902-2256
aapilakowski@tva.gov

Re: TVA Draft Environmental Assessment (DEA) for the Potential Bull Run Fossil Plant Retirement

Dear Ms. Pilakowski:

The U. S. Environmental Protection Agency has reviewed the referenced document in accordance with Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The EPA appreciates the opportunity to review and provide comments.

The EPA understands that the Tennessee Valley Authority (TVA) has experienced a flat to declining load, similar to a Distributed Marketplace scenario in the 2015 IRP, and natural gas prices have remained relatively low. These conditions have prompted TVA to conduct an economic analysis of all its generating assets considering load outlook, economic benefits, costs, performance, and environmental and social impacts. TVA assets that have relatively high projected future maintenance costs and environmental compliance expenditures, and a high forced outage rate and poor generation portfolio fit have been the focus of more detailed study for potential retirement. Bull Run Fossil Plant (BRF) falls into this category of assets to be potentially retired.

The EPA has reviewed the DEA and the two (2) alternatives for potentially retiring BRF. The alternatives are as follows: No Action alternative (Alternative A)--TVA would implement all of the planned actions related to the current and future management and storage of CCRs at BRF; and Alternative B would retire Bull Run Fossil Plant and cease coal burning operations. TVA would implement the planned actions related to the current and future management and storage of CCRs at BRF, which have either been reviewed or will be in subsequent NEPA analyses.

The EPA concurs with the analysis of Alternative B because it offers long-term beneficial impacts on water resources such as the Clinch River and the Melton Hill Reservoir fishery. From our review of the DEA, the EPA's has identified potential impacts to air, water, wetlands, solid/hazardous waste, noise, social economics and especially long-term plans for remaining facilities. Because the selected facility buildings, structures, and facilities would remain in place under this alternative, there would be a long-term potential for direct discharges of chemicals, hazardous waste, and solid waste. The direct effects of sitting structures in Alternative B include but are not limited to friable asbestos releases, sump discharges into receiving waters, and storm water releases into adjacent surface waters. The EPA recommends periodic inspections and maintenance of the remaining facilities to be performed as needed to ensure that any contaminated equipment would not impact surface water quality. The EPA also recommends TVA implement Best Management Practices (BMP)s, protocols to respond to on-site spills prior to discharge, and site clean-up measures that would help to reduce the potential for any releases to surface waters. TVA should implement supplemental mitigation

measures required pursuant the 2015 Administrative Order issued by the Tennessee Department of Conservation (TDEC) in August 2015. The TVA should implement the closure plan that was approved by TDEC and includes additional monitoring, assessment, corrective action programs, or other actions deemed appropriate as specified in the Environmental Investigation Plan (EIP) (TVA 2017). Please continue to keep the community informed throughout the project, and upon completion of your Final Environmental Assessment, please forward 2 hard copies to the NEPA Program Office (address below).

Thank you for the opportunity to provide comments on your proposed project. If you have any questions, feel free to contact me via the information provided below.

Sincerely,

Larry O. Gissentanna
DoD and Federal Facilities, Project Manager
U.S. Environmental Protection Agency/ Region 4
Resource Conservation and Restoration Division
National Environmental Policy Act (NEPA) Program Office
[redacted]

From: Ann Ercelawn
To: Pilakowski, Ashley Anne
Subject: Paradise Fossil Plant and Bull Run Plant
Date: Saturday, December 8, 2018 3:17:25 PM

TVA External Message. Please use caution when opening.

Both of these plants should be closed. We the people want clean non polluting energy sources such as wind and solar. We benefit by cleaner air and protection of the earth. Rising carbon emissions from fossil fuels are endangering all of us.

Ann Ercelawn

From: The Federal Farmer
To: Pilakowski, Ashley Anne
Subject: Bullrun Steam Plant closure
Date: Thursday, November 22, 2018 7:07:44 AM

When TVA stole/flooded our land we were promised cheap (and in some cases, free) electricity for life.
Instead, TVA sells the electricity generated by hydroelectric dams to neighboring states at below market prices, then pollutes the Tennessee Valley by burning coal.

From: [redacted]
To: Pilakowski, Ashley Anne
Subject: Comments on Bull Run and Paradise fossil plants
Date: Wednesday, December 19, 2018 8:51:21 PM

TVA External Message. Please use caution when opening.

Hi

I'd like to offer strong support for TVA's plans to close the Bull Run and Paradise fossil plants. As I understand these are both running under capacity, and of course coal is a dirty fuel in terms of both mining and burning. I am a PhD scientist and I work in the broad field of climate science, particularly soil carbon emissions. Climate change as a result of fossil fuel burning is a serious issue as recently documented in the National Climate Assessment (NCA) and the State of the Carbon Cycle Report (the latter of which I am one of the lead editors), released on Nov 23 2018. The latter report documents dramatically decreased energy emissions in the US and North America as a result of fuel switching to renewables and natural gas, along with other improved technologies, all the while GDP continues to increase. The NCA documents climate changes that are happening NOW and are certain to get much worse, so I really applaud TVA's proposal. I encourage TVA to replace these plants with renewables and/or low carbon emitting technologies, when and if there is a need.

I also live in Oak Ridge TN. I am aware of the Oak Ridge City Council's short sighted recommendation to keep it open, even though the city claims to have a "climate action plan". Kindly ignore them.

Finally I am very concerned about the storage of fly ash and waste products on site. I am sure that steps will need to be taken to ensure safe disposal of these materials and prevent contamination of our ground and surface waters. This must be a part of the closure plan.

Thank you Dr Melanie Mayes

From:	Ron
To:	Pilakowski, Ashley Anne
Subject:	Bull Run comments
Date:	Monday, December 17, 2018 10:39:59 AM

In response to the article in the OakRidger entitled, "What if Bull Run closes? Council inks concerns", I had an idea for consideration should the plant be shut down.

The Department of Energy could be asked if the site would have the resources needed for housing the next generation(s) of supercomputers.

Summit, ORNL's current world-wide leader in supercomputers will come online early in 2019. ORNL is already gearing up for the next generation of supercomputing called "exascale".

Prior to Summit, a proposal to DOE to build a new facility for supercomputing growth was presented by ORNL. It cited many issues such as electrical infrastructure along with cooling capacity needs that were detrimental to future growth. That proposal was not approved, but money was made available to expand and provide infrastructure on site for Summit.

As reported in the article, "The city letter stated the land is ideal for industry, citing its barge, railway and highway connections and available electrical lines.". Electrical lines and being close to a water source that may provide efficient cooling could be an asset. In addition, researchers now at ORNL could find office space and other resources beneficial at this site, opening up more research space/laboratories at ORNL.

The Mayor Pro Tem Rick Chinn, also said, "he supported future industry there. He said the site could be used for a data center due to all of the electrical lines that could connect to it.". Maybe not just one supercomputer, but several smaller ones could be housed there.

Maybe now would be a good time for a discussion between representatives of TVA, DOE and ORNL for such a purpose.

Ron Mulig

From:	Nancy Munro
To:	Pilakowski, Ashley Anne
Subject:	Closing Bull Run Steam Plant and unit at Paradise
Date:	Thursday, November 29, 2018 11:54:26 AM

Hello Ms. Pilakowski,

I would like to comment on the potential closure of the coal-fired steam power plants, Bull Run and a unit at Paradise.

My husband and I are long-time residents of Oak Ridge TN, where we live at 1351 Tuskegee Drive.

I applaud the plan to close these plants. I believe all your coal-fired plants should be closed as soon as possible for several reasons.

- We need to move away from fossil-fueled plants as soon as possible to reduce CO2 emissions.
- The emissions, aside from CO2, have adverse effects on human health.
- The approaches to storing coal ash are not safe.

I am retired from ORNL where I studied the effects on human health of various energy technologies including emissions from coal combustion approaches.

I urge TVA to move to using more solar and wind power to the maximum extent possible, while also encouraging energy conservation in homes, commercial buildings, and the transportation sector.

Thank you for considering these comments.

Nancy B. Munro, PhD

Ashley Pilakowski
NEPA Compliance
aapalakowski@tva.gov
400 West Summit Hill Drive, WT 11D
Knoxville, TN 37902

December 19, 2018

Via Electronic Mail

Re: Sierra Club and National Parks Conservation Association Comments on TVA's Potential Bull Run Fossil Plant Retirement Draft Environmental Assessment

Dear Ashley Pilakowski,

On behalf of the Sierra Club and the National Parks Conservation Association (collectively, the "Conservation Groups" and their thousands of members throughout the Tennessee Valley Authority ("TVA") service territory we submit the following comments on TVA's Potential Bull Run Fossil Plant Retirement Draft Environmental Assessment (the "Draft EA").

The Conservation Groups wholeheartedly support the Preferred Alternative of retiring the Bull Run coal-fired unit. Bull Run is an expensive facility for power generation, particularly in an age of plummeting costs for clean, carbon-free renewable energy and energy efficiency. TVA has been a regional and national leader in planning for a just transition to cleaner, lower cost forms of energy. Moreover, as TVA recognizes, keeping Bull Run limping into the future will require significant capital expenditures to install water pollution control systems to address the mercury, selenium, and arsenic the plant currently discharges into the Tennessee River.

As explained more fully below, retiring Bull Run will confer enormous environmental benefits to the Tennessee Valley and beyond, by ending the vast quantities of air and water pollution—including greenhouse gas pollution—the facility creates, as well as by ceasing to add to the lifecycle problems of mining and transporting the coal it burns and disposing of the coal ash it generates.

Accordingly, the Conservation Groups urge TVA to finalize the EA and implement the Preferred Alternative of retiring Bull Run.

Statutory and Regulatory Background

NEPA is "our basic national charter for protection of the environment."[1] Other environmental statutes focus on particular media (like air, water or land), specific natural resources (such as wilderness areas, or endangered plants and animals), or discrete activities (such as mining, introducing new chemicals, or generating, handling or disposing of hazardous substances). In contrast, NEPA applies broadly "to promote efforts which will prevent or eliminate damage to the environment."[2]

> [NEPA] has twin aims. First, it places upon [a federal] agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.[3]

To accomplish its goal of informed decision-making, NEPA requires the agency proposing the action to provide a full and fair analysis of the environmental impacts of a proposed action and its alternatives.[4] In order to engage in this analysis, the agency must (1) define the purpose of its action; (2) identify alternatives that might help it achieve that purpose; and (3) describe an accurate environmental baseline against which to evaluate the impacts of the proposed action and its alternatives.[5] To the extent an agency proposes to "tier" its analysis from a programmatic EIS, such tiering is not intended to allow the agency to obscure the extent of site-specific environmental impacts or to narrow artificially the alternatives available during site-specific analysis.[6]

NEPA "emphasizes the importance of coherent and comprehensive up-front environmental analysis to ensure informed decisionmaking to the end that 'the agency will not act on incomplete information, only to regret its decision after it is too late to correct.'"[7] Only after fully evaluating a reasonable range of alternatives and the environmental impacts associated with each in compliance with NEPA may an agency determine its preferred course of action.

Factual Background

Bull Run is an 881-megawatt coal-fired power plant in Anderson County, Tennessee on the Clinch River, and was built between 1962 and 1966. In 2017, Bull Run emitted over 1300 tons of smog-forming nitrogen oxides ("NOx"), over 560 tons of sulfur dioxide (SO2), and

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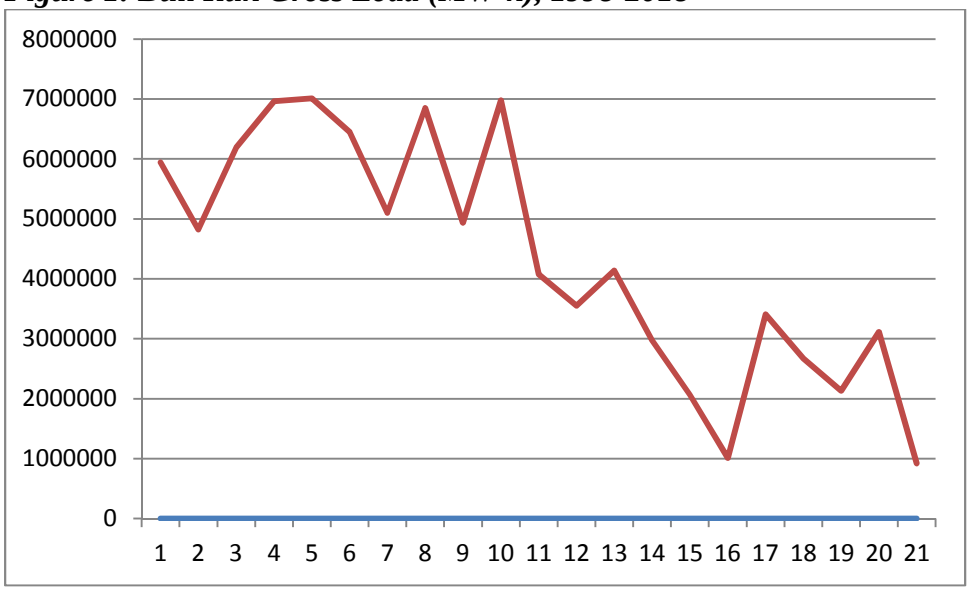
[1] 40 C.F.R. § 1500.1(a).
[2] National Environmental Policy Act § 2, 42 U.S.C. § 4321.
[3] *Kern v. Bureau of Land Mgmt.*, 284 F.3d 1062, 1066 (9th Cir. 2002) (quoting *Balt. Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983)) (internal quotations and citations omitted, alteration in original).
[4] 40 C.F.R. § 1502.14.
[5] 40 C.F.R. §§ 1502.13-16.
[6] *California v. Block*, 690 F.2d 753, 761 (9th Cir. 1982). ("The critical inquiry in considering the adequacy of an EIS prepared for a large scale, multi-step project is not whether the project's site-specific impact should be evaluated in detail, but when such detailed evaluation should occur."); *id.* at 763 ("The promise of site-specific EIS's [sic] in the future is meaningless if later analysis cannot consider wilderness preservation as an alternative to development.").
[7] *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998).

nearly three million tons of carbon dioxide.[8] Over the past ten years, Bull Run alone has emitted 27.6 million tons of carbon dioxide.[9] According to EPA's Toxics Release Inventory, Bull Run in 2017 released or disposed of 218 pounds of mercury compounds, and over 19,000 pounds of arsenic compounds.

Bull Run, like other coal-fired units in TVA's fleet, lacks environmental controls necessary to comply with federal Clean Water Act requirements such as the Effluent Limitation Guidelines, 80 Fed. Reg. 67,838 (Nov. 3, 2015), 40 C.F.R. part 423, requiring elimination of certain waste streams and setting limits on discharges of mercury, arsenic, and selenium for others. TVA estimates that it would need to spend $466 million by 2023 to upgrade its coal fleet with such controls.[10] This is on top of the $1.2 billion TVA estimates is required for the utility's Coal Combustion Residuals program, to address legacy pollution issues from coal ash generated by plants like Bull Run.

Bull Run is also expensive to operate, and an inflexible resource increasingly out of step with the needs of TVA's system.

Figure 1: Bull Run Gross Load (MW-h), 1998-2018[11]



As demonstrated in Figure 1, above, Bull Run's generation has declined precipitously in the past ten years, from an average of 6-7 million megawatt-hours per year to closer to 2 million megawatt-hours. In other words, Bull Run's dispatch has declined by more than two-thirds.[12]

[8] Data taken from U.S. EPA's Clean Air Markets Program Data database, *available at* https://ampd.epa.gov/ampd/.
[9] *Id.*
[10] *See* Tennessee Valley Authority Form 10-K (Sept. 30, 2018), *available at* https://www.sec.gov/Archives/edgar/data/1376986/000137698618000046/tve-10xk09302018.htm.
[11] Data taken from U.S. EPA's Clean Air Markets Program Data database, *available at* https://ampd.epa.gov/ampd/.
[12] Nor is Bull Run needed for any sort of system resiliency. *See, e.g., Grid Reliability & Resilience Pricing Grid Resilience in Reg'l Transmission Organizations & Indep. Sys. Operators*, 162 FERC ¶ 61,012 (Jan. 8, 2018) (rejecting the Department of Energy's suggestion that retirements of uneconomic coal plants have threatened energy security); *id.* at *16 & nn. 65-66 (Glick, Comm'r, concurring) ("There is no evidence in the record to suggest that

Substantive Comments

As noted above, the Conservation Groups strongly agree with TVA's proposed Preferred Alternative, and believes that retiring Bull Run is in the best economic and environmental interest of TVA, TVA's customers, and the Tennessee Valley as a whole. Accordingly, Sierra Club likewise agrees with TVA's proposed findings of environmental benefits accruing from the Preferred Alternative in the Draft EA. However, as explained in more detail below, the Draft appears to significantly undercount such environmental benefits. As such, the Draft EA should be revised before finalization to more strongly reflect the reality that Bull Run's retirement would result in very large and extensive environmental benefits.

A. Retiring Bull Run Would Eliminate Vast Quantities of Air Pollution

The Conservation Groups agree very strongly with TVA's statements in the Draft EA that "Implementation of the Proposed Action to shut down BRF would positively affect air quality both locally and regionally by elimination of the emissions from coal-fired electricity generation" and that it "would contribute to a lessening of the rate of increase of global GHG emissions and atmospheric concentrations of greenhouse gases". Draft EA at 16. However, TVA appears to under-assess the significance of those emission reductions, and their environmental benefits.

Although TVA recognizes in the Draft EA that retirement of Bull Run would lead to reductions in air pollution from both the plant itself and mining operations supporting the plant, the Draft EA wrongly suggests that this would only lead to "minor" improvements in air quality. Contrary to TVA's draft assessment, Bull Run currently emits huge amounts of both conventional and greenhouse gas pollutants; retiring the facility would therefore dramatically reduce the amount of pollution TVA pumps into the atmosphere.

As noted above, Bull Run emits large amounts of NOx pollution. NOx is a critical precursor for ground-level ozone pollution. Ozone, the main component of smog, is a corrosive air pollutant that inflames the lungs, constricts breathing, and likely kills people. *See* U.S. EPA, National Ambient Air Quality Standards for Ozone, 80 Fed. Reg. 65,292, 65,308/3-09/1 (Oct. 26, 2015); U.S. EPA, Integrated Science Assessment for Ozone and Related Photochemical Oxidants 2-20 to -23 tbl.2-1 (EPA-HQ-OAR-2008-0699-0405, Feb. 2013) ("ISA"). It causes and exacerbates asthma attacks, emergency room visits, hospitalizations, and other serious health harms. *See, e.g.*, EPA, *Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards* 3-18, 3-26 to -29, 3-32 (EPA-HQ-OAR-2008-0699-0404, Aug. 2014) ("PA"); ISA 2-16 to -18, 2-20 to -24 tbl.2-1. Ozone-induced health problems can force people to change their ordinary activities, requiring children to stay indoors and forcing people to take medication and miss work or school. *See, e.g.*, PA 4-12.

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temporarily delaying the retirement of uncompetitive coal and nuclear generators would meaningfully improve the resilience of the grid. . . . In addition, coal and nuclear generators face resilience challenges of their own. As has been well-documented, many coal and nuclear plants with significant on-site fuel supplies have failed to function during extreme weather events because those fuel supplies froze, flooded, or were otherwise unavailable.").

Ozone can harm healthy adults, but others are more vulnerable. *See* 80 Fed. Reg. at 65,310/1-3. Because their respiratory tracts are not fully developed, children are especially vulnerable to ozone pollution, particularly when they have elevated respiratory rates, as when playing outdoors. *See, e.g.*, PA 3-81 to -82. People with lung disease and the elderly also have heightened vulnerability. *See* 80 Fed. Reg. at 65,310/3. People with asthma suffer more severe impacts from ozone exposure than healthy individuals do and are more vulnerable at lower levels of exposure. *Id.* at 65,311/1 n.37, 65,322/3.

Ozone also damages vegetation and forested ecosystems, causing or contributing to widespread stunting of plant growth, tree deaths, visible leaf injury, reduced carbon storage, and reduced crop yields. PA 5-2 to -3; ISA 9-1. The damage includes tree-growth losses reaching 30- 50% in some areas, and widespread visible leaf injury, including 25-37% of sites studied in just one state. PA 5-13; ISA 9-40. By harming vegetation, ozone can also damage entire ecosystems, leading to ecological and economic losses. 80 Fed. Reg. at 65,370/1-2, 65,377/3. Bull Run affects the airshed of Great Smoky Mountains National Park, home to at least thirty ozone sensitive species including black cherry trees, milkweed and cutleaf coneflower.[13]

Table 1: Bull Run NOx Emissions, 2009-2017[14]

Year	Tons NOx
2009	1271
2010	1221
2011	912
2012	747
2013	431
2014	1192
2015	1017
2016	897
2017	1301

As Table 1 above demonstrates, Bull Run averages emissions of over a thousand tons of ozone-forming NOx every year. Further, a significant amount of this pollution is emitted in short-term spikes, which may be of particular concern given the short-term 8-hour National Ambient Air Quality Standard ("NAAQS") for ozone. While Bull Run's annual average NOx emission rate for 2017 was 0.09 lbs./MMbtu, there were many operating hours during that year when Bull Run's NOx emission rate was far higher: in over 300 hours of 2017 the emission rate was at least triple that annual average, 231 hours with an emission rate of quadruple that average, and 121 hours with an emission rate of quintuple that average.[15] Many of those high-emission rate hours occur during startup and shutdown of the Bull Run boiler, when controls may be less effective or bypassed altogether.

[13]National Park Service, Great Smoky Mountains National Park, Air Quality, *available at* https://www.nps.gov/grsm/learn/nature/air-quality.htm.
[14] Data taken from U.S. EPA's Clean Air Markets Program Data database, *available at* https://ampd.epa.gov/ampd/.
[15] Data taken from U.S. EPA's Clean Air Markets Program Data database, *available at* https://ampd.epa.gov/ampd/.

Not only are those high-emission hours associated with startup and shutdown themselves significant, but as Bull Run as declines in terms of total dispatch, it is likely to increase the number of times annually it goes through startup and shutdown. As such, as time goes on, Bull Run is likely to contribute to more spikes in smog-causing pollution. Thus, as compared to the No Action Alternative, the Preferred Alternative represents of retiring Bull Run amounts to a very significant reduction in pollution, and a concomitant improvement in air quality.

The situation is similar for SO_2 pollution. Although—as with NOx—Bull Run used to emit even higher quantities of SO_2 than it has of recent years, the facility still emits hundreds of tons annually.

Table 2: Bull Run SO_2 Emissions, 2009-2017[16]

Year	Tons SO2
2009	467
2010	890
2011	570
2012	305
2013	210
2014	557
2015	431
2016	360
2017	563

Exposure to SO_2 in even very short time periods—such as five minutes—has significant health impacts and causes decrements in lung function, aggravation of asthma, and respiratory and cardiovascular morbidity. *See* Envtl. Prot. Agency, EPA/600/R-08/047F, *Integrated Science Assessment for Sulfur Oxides—Health Criteria* ch. 5 tbls. 5-1, 5-2 (2008), *available at* http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download _id=491274; Final Rule, 75 Fed. Reg. at 35,525 (June 22, 2010); *see also* EPA, *Our Nation's Air: Status and Trends Through 2008* 4 (2010) (noting that the health effects of sulfur dioxide exposure include aggravation of asthma and chest tightness), *available at* http://www.epa.gov/airtrends/2010/report/fullreport.pdf. EPA has determined that SO_2 exposure can also aggravate existing heart disease, leading to increased hospitalizations and premature deaths. EPA, *Sulfur Dioxide - Health*, *available at* http://www.epa.gov/oaqps001/sulfurdioxide/health.html. Further, short-term SO_2 exposure is especially risky for children with asthma. *See* Final Rule, 75 Fed. Reg. at 35,525.

Sulfur dioxide is also associated with particulate matter pollution, regional haze, and acid rain, all of which threaten the natural environment. In particular, impairment of our national parks by sulfur dioxide pollution is a critical issue. National Parks like Great Smoky Mountains National Park are accordingly negatively impacted by SO_2 emissions in the Beaver Valley nonattainment area.

[16] Data taken from U.S. EPA's Clean Air Markets Program Data database, *available at* https://ampd.epa.gov/ampd/.

Retiring Bull Run would lead to virtually a complete cessation of these emissions, as TVA acknowledges. *See* Draft EA at 19 (noting a drop of 97.6% in SO_2 emissions if Bull Run went offline and its generation was replaced by combined cycle gas generation).

Perhaps more significant are the greenhouse gases that Bull Run emits. Like any coal-burner, Bull Run emits colossal quantities of carbon dioxide.

Table 3: Bull Run CO_2 Emissions, 2008-2017[17]

Year	Tons CO_2
2008	4,577,691
2009	3,017,952
2010	3,675,706
2011	2,703,701
2012	1,922,963
2013	954,699
2014	3,173,549
2015	2,510,476
2016	2,052,658
2017	2,993,904
TOTAL	**27,583,299**

TVA's Draft EA is largely silent on the climate change implications of these emissions.[18] This is unfortunate, as the elimination of millions of tons of CO_2 emissions annually would confer enormous environmental benefits. For example, even using a relatively low estimate of the harm caused by greenhouse gas emissions such as the $42 per ton social cost of carbon,[19] Bull Run's CO_2 emissions alone cause at least $116 million worth of harm *every year*. Over the next ten years, that would mean well over a billion dollars' worth of harm, even if Bull Run were to continue its long-term trend of low and declining dispatch over time.

As the Fourth National Climate Assessment notes,

> The impacts of climate change are already being felt in communities across the country. **More frequent and intense extreme weather and climate-related events**, as well as changes in average climate conditions, **are expected to continue to damage infrastructure, ecosystems, and social systems that provide essential benefits to communities**. Future climate change is expected to further disrupt many areas of life, exacerbating existing challenges to prosperity posed by aging and deteriorating infrastructure, stressed ecosystems, and economic inequality. Impacts within and across regions will not be distributed equally. **People who are already vulnerable, including lower-income and**

[17] Data taken from U.S. EPA's Clean Air Markets Program Data database, *available at* https://ampd.epa.gov/ampd/.
[18] TVA does note that CO2 "has the potential to affect changes in climate," which is an unfortunate understatement. Draft EA at 16.
[19] *See* https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html.

> **other marginalized communities, have lower capacity to prepare for and cope with extreme weather and climate-related events and are expected to experience greater impacts**.

Fourth National Climate Assessment at 25 (emphasis added).[20] Climate change impacts in the form of extreme weather, damage to infrastructure, to ecosystems, and to social systems, and disparate impacts on environmental justice communities are exactly the sorts of things TVA should be assessing as part of the "hard look" required under NEPA. Particularly given the extremely significant role that the electricity sector—and utilities like TVA—play in the U.S.'s greenhouse gas emission profile, as well as the outsized part coal plays in generating those emissions, the Draft EA should have included an assessment of the greenhouse gas reductions flowing from the Preferred Alternative. Given the critical need to reduce CO_2 emissions, retirement of Bull Run (particularly when coupled with replacement by zero-carbon renewable resources such as wind and solar generation) would confer enormous environmental benefit.

Accordingly, while TVA ultimately is correct that retiring Bull Run would be beneficial in its Draft EA NEPA analysis, TVA undercounts those benefits it its examination of reductions in air pollution. Bull Run's retirement would be far more beneficial than even the Draft EA suggests.

B. Retiring Bull Run Would Confer Enormous Environmental Benefits by Eliminating Entrainment and Impingement of Aquatic Life

TVA fails to assess an enormous category of environmental benefit for its Preferred Alternative in the Draft EA by only giving cursory consideration to the impacts of Bull Run's cooling water system. Draft EA at 24 ("The elimination of withdrawals of cooling water as a result of cessation of coal-burning operations would reduce impingement and entrainment impacts, and have other beneficial impacts from reduced water consumption.").

Because Bull Run uses once-through cooling (i.e., it does not recycle water internally through cooling towers) this system withdraws and ultimately discharges roughly one-half *billion* gallons of water per day from the Clinch River as a way of sinking heat away from plant operations. In the process, Bull Run impinges large amounts of aquatic life on screens on the intakes for its cooling water, and entrains vastly more aquatic life by sucking it into the system. Both impingement and entrainment are harmful to aquatic life. Indeed, entrained organisms are virtually universally killed.

The numbers of organisms Bull Run impacts in this way are staggering. According to TVA's own entrainment report, Bull Run kills well over 8 million fish per year by entraining them (a majority of which are fish eggs). These fish kills would cease if Bull Run were retired.

Impingement and entrainment are not the only impacts to the Clinch River flowing from Bull Run's cooling water system, however. Again, because Bull Run lacks a system of cooling

[20] USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)], *available at* https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf.

towers for recirculating its cooling water, it instead dumps heated water back into the river. This thermal pollution negatively changes ecosystems in the Clinch River downstream of the discharge point, as water temperature is one of the most important aspects of water quality for the aquatic life living therein.

Although TVA does discuss at some length the impacts of this thermal pollution from Bull Run on the Clinch River, TVA's assessment is clouded by its failure to focus not on the amount of heat and consequent thermal plume Bull Run adds to the water, but instead on things like the temperature differentials between Bull Run's intakes and Clinch River surface water. Adding some half a billion gallons of water per day that has been heated by Bull Run's average 10.6 degrees Celsius by running it through the plant's heat condensers results in the addition to the Clinch River of more than 80 terajoules of energy *every single day it operates*. This vast quantity of thermal pollution is enormously disruptive to the Clinch River, and would cease if Bull Run were retired.

Conclusion

For the foregoing reasons, TVA's Proposed Alternative to retire the Bull Run coal-fired power plant would confer even greater environmental benefits than the Draft EA suggests. As a result, the Conservation Groups strongly urge TVA to finalize the EA, and proceed with its proposed retirement of the plant, while making a concerted effort to provide its workers and local communities with just transitions. Such action would continue the process of transitioning TVA and the Tennessee Valley as a whole towards low cost clean, renewable energy, to the benefit of ratepayers, TVA itself, and the environment.

/s/
Zachary M. Fabish
Senior Attorney
[redacted]

Stephanie Kodish
Senior Director & Counsel
Clean Air Program
National Parks Conservation Association
[redacted]

SIERRA CLUB

December 19, 2018

Ms. Ashley Pilakowski
Tennessee Valley Authority
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902

Via Email Delivery

Re: Comments on draft environmental assessments on the potential retirements for Bull Run and Paradise fossil plants

Dear Ms. Pilakowski:

I support the TVA's proposal to retire the Paradise coal unit by 2020 and the Bull Run coal unit by 2023.

Coal is less economically viable every day, imposing an unnecessary burden on the families and businesses that you serve. TVA's prudent decision to retire the coal units at Paradise and Bull Run recognizes that reality. Paradise and Bull Run have too many risks, too high costs, and too few benefits to have a long-term place in our region's energy mix. Old, uneconomic coal plants will not bring us the jobs and power of the future.

Your draft environmental assessments confirm that TVA's energy supply will remain secure and reliable with the closure of the Paradise and Bull Run units. In addition, as TVA recognizes, retiring these units would save TVA customers money, while also reducing air, water, and coal ash pollution that harm and threaten communities and public lands. Paradise and Bull Run are older, less efficient, significantly costlier to run, and dirtier than other more economical energy resources that TVA should pursue instead.

Retiring these coal units should also be accompanied by a real effort to provide a just transition to TVA employees and the surrounding communities, so that all will benefit as we move to clean, reliable, low-cost energy in the Tennessee Valley.

Thank you for your consideration of my comments.

Sincerely,

Sierra Club Member

Comments Submitted through TVA's Online Comment Management System

First Name	Last Name	City	State	Postal Code	Personal Message
David Blane	Newberry	Clarksville	TN	37043	As a member of CEMC I want you to be constantly planning and moving toward cleaner and greener energy. Thank you for all you
Linda	Myers	Knoxville	TN	37938	Climate change is the number one threat to our world today. We have a very small window of time to slow, mitigate or even reverse that threat. We are already suffering the devastating effects; they are coming quicker than anticipated. Retiring these two coal units and transitioning to clean energy is a major step to protecting our local environment, which, of course, contributes to the world environment. I encourage TVA, with all my heart and soul, to stay the course, make the transition to clean energy happen and happen quickly. Retraining of TVA employees and the workers of the affected communities for jobs in the clean energy industry should be part of this package. Please see to their immediate welfare, as well. Thank you for taking this significant and positive step for all of us.
Dorothy	Swann	Columbia	TN	38401	Yippee! thank you for being responsible and acting to protect our future.
Thomas	Morris	Bowling Green	KY	42104	As the threat of climate change becomes more urgent by the day, please do the responsible thing for all of our children and grandchildren, and accellerate the move to renewable, green energy sources. Tom Morris
David	Riall	Chattanooga	TN	37412	This is just common sense!
Dennie	Kirtley	Nashville	TN	37211	In many ways, Tennessee is a paradise full of natural wonders. The more we can do to lessen our footprint on the environment, the better things will be for children and grandchildren. Retiring these coal units should also be accompanied by a real effort to provide a just transition to TVA employees and the surrounding communities, so that all will benefit as we move to clean, reliable, low-cost energy in the Tennessee Valley. Thank you for your consideration of my comments. Sincerely,
Jennifer	Powers	Kingsport	TN	37660	Let's do what is right to make everyone, including the environment, healthier.
James	Butler	Smyrna	TN	37167	Coal is the past, it is dirty, hazardous to obtain and leaves lasting damage. Move to sustainable, clean energy for our sake and the children's sake
Linda	Sammataro	Knoxville	TN	37919	Please listen to the many millions of Americans who abhor using dirty fossil fuels in this time, when it is abundantly obvious that they are poisoning our air and water. Renewable power is necessary immediately.
Edward	Jepson	Knoxville	TN	37923	Please, instead of being an obstace, I beseech you to act as a leader in this crucial period of transition away from fossil fuels. Not only are we, as a society, depending on you, but so is TVA itself, as renewables are the future.
Gloria	Cash-Procell	Huntsville	AL	35803	Move away from fossil fuels.
Nancy	Neilsen	Maryville	TN	37803	Living in the Knoxville area these last 30 years, I have noticed a distinct improvement in the air quality, especially in the summer. We must make decisions to continue to improve the air we breathe. It is economically in our favor to do this.

Laura	Humphrey	Knoxville	TN	37901	In addition, I prefer cleaner options to replace any needed generation from coal plant closures, such as solar or wind. I would like to see TVA adopt some options for hydro-solar projects considering all of the hydro production in its service territory. Or further demand-side management by providing more options for energy efficiency projects could help lower TVA costs and need for additional generation. These types of innovative projects should be what TVA is known for rather than legacy wastes from coal damaging our communities in the southeast. These options are also highly preferable to me instead of further gas plants. Although the legacy wastes aren't an issue with gas, the damages to the environment from fracking cannot be ignored. To me, "natural gas" is anything but "natural."
Lara	Miller	Knoxville	TN	37923	Move forward, not back.
Thomas	Haehn	Nashville	TN	37216	Even if Energy becomes more expensive, we need to understand that we can't continue to pollute the planet and expect to live on it. There will be a price to pay, and I rather pay with money now, than with human life later.
Todd	Waterman	Clinton	TN	37716	I believe we have a responsibility to future generations to protect them from the devastating environmental and economic impacts of CO2-intensive coal. I live a couple miles from Bull Run, and I also worry about the soot I often see coming from its scrubber and the coal ash sitting in the middle of Melton Lake. It is cheaper already to build a new solar installation than to run antiquated coal plants like Bull Run and Paradise. Thank you!
Sylvia	Percy	Columbia	TN	38401	Coal is just too dirty to burn especially in large quantities.
Bethany	Harrell	Unicoi	TN	37692	I want people to be able to breath cleaner air and drink cleaner water. I want our area to be ahead of the curve on renewable energy to remain competitive in the energy market.
Mary	Landrum	Franklin	KY	42134	This is long past due and very needed, thank you.
Dodd	Gaslbreath	Nashville	TN	37204	I am particularly concerned about our region's inability to compete with cleaner regions of the world and country. Future citizens and investors will move to clean energy regions. Lets get started now by retiring these dirty plants and adding clean, local systems that are not fossil fuels nor vulnerable to Earth quakes and 1000's of years of nuclear decay as are small modular nuclear plants.
Scott	Banbury	Memphis	TN	38107	We want clean energy now!
Andrea	White	Smyrna	TN	37167	I am a kayaker. Kayakers and folks who enjoy water sports have a particularly poignant appreciation of water quality since we end up having inadvertent out-of-boat experiences and end up consuming that water. Coal ash is the enemy of clean water.
Steve	Perkins	Huntsville	AL	35803	I would LOVE to see TVA take on a LEADERSHIP role in phasing out all Fossil Fuel Plants and systematically replacing them with sustainable green energy sources! I know this cannot magically happen overnight, but with a well planned approach, TVA could proudly show the rest of the Nation how to transition to green energy over a reasonable timeframe! The time has come for ACTION!
Michael	Pardee	Knoxville	TN	37919	As a KUB customer and resident of Knoxville, I urge you to make every effort to transition to more use of sustainable, non-polluting and environmentally friendly energy sources including wind, sun and water.
Jerry & Debbie	Brown	Lewisburg	TN	37091	We should catch up with rest of the country and most of the world. Let's invest in clean energy.
Alicia	Portillo	Dyersburg	TN	38024	We need cleaner air.
Richard	Heinsohn	Nashville	TN	37206	As Tennesseans, I say, Let's be part of the solution to climate change and move quickly to clean up our state, rather than draging on as part of the problem when clean jobs and energy are an absolute imperative for our future. Climate change already poses dire consequences for everyone on Earth, but we can make a difference if we act now. Shut it down! Coal is a major part of the problem! Thank you, Richard heinsohn

Liane	Russell	Oak Ridge	TN	37830	I live close to the Bull Run coal-fired plant, and would love to see it retired as soon as possible -- the huge coal pile gone, coal ash no longer a problem, and, best of all, knowing that a major part of the power TVA supplies will be generated by clean technologies (which generate jobs) in lieu of adding to the greenhouse gases that spell doom to life on our wondrous planet.
Edith	Chapman	Huntsville	AL	35805	Please make our air cleaner and our water safety a priority in getting rid of dirty coal. If you retire the Bull Run and Paradise power plants that you will help the people that lose their jobs to retrain for new jobs as well. Thank you for considering this. Mrs. Edith Chapman
Charles	Gee	Brentwood	TN	37027	I lived in Oak Ridge for almost 10 years between exposure to radiation in DOE plants and spewing of harmful particulates from Kingston and Bull Run steam plants it is no wonder that the rate of cancer cases in the region was far above the National norm. Clean up the Tennessee Valley with cleaner forms of energy now!
Brian	Inzer	Owens Cross Roads	AL	35763	A SHIFT TO RENEWABLE POWER IS NOT AN OPTION.. FAILURE TO MODERNIZE OUR POWER SYSTEMS WILL MEAN A FAILURE OF THIS COUNTRY TO COMPETE ON THE WORLD STAGE...
Cyd	Hamilton	Sevierville	TN	37876	This would be an economically more viable choice in the short- and long-term for TVA. Saving money in reduced future environmental mitigation settlement costs, savings in terms of potential future CAA violations (under a different administration) are two examples that readily come to mind.
Jacob	Doss	Good Hope	AL	35057	Since childhood, it has been my understanding and impression of TVA that you work to produce power in harmony with and with the least potential negative impact to our local environments. Thank you for taking the initial steps to improve upon these antiquated and highly inefficient production systems, but please continue to address current and future issues with the same commitment to science and our environment that guided the earliest decisions of TVA founders.
Colleen	Sheppard	Nashville	TN	37203	This is so important. Please don't ignore the importance of your following through pulling away from coal.
Sharon	Holmes	Elizabethton	TN	37643	I am a fourth generation East Tennesseean who has dealt with TVA. My life and certainly my ancestors lives have been both improved and greatly diminished by the work of TVA in East Tennessee. While the family land that I should have inherited sits under a lake , I realize that TVA did bring electricity to my area. At such a cost to the poor families of our area. Please don?t do this again. Please be the forerunner in your industry to bring the best energy possible to all of the world. I want to write a letter to my children that will finally praise TVA for correcting the horrific errors they made generations ago. Please do the right thing. There is no more beautiful place than East Tennessee. Your actions will keep the Eagles flying, the Herons fishing in the rivers and the air clean for breathing. Thank You
Art	Collier	Big Sandy	TN	38221	When the Johnsonville, TN unit was retired decades of pollution that came down on my parents who lived there finally stopped. No more did the finish on their cars rust out early and clothes could be hung out to dry without dingy yellowing. With natural gas at historic lows it it time.
Carol	Helms	Morristown	TN	37814	There is no future in coal. Solar can provide jobs and safe for the environment.
Kent	Gardner	Elizabethton	TN	37643	Coal is an obsolete energy source, time to switch to renewable forms of energy that don't make hazardous waste like coal does.
Robin	Happel	Bronx	TN	37604	Phasing out coal plants will help improve air quality and make our communities healthier and more resilient. Renewables typically come back online much faster than coal after major storms, which is a major issue for me after watching my family and friends weather Florence this past fall!
Kimberly	Barnes	Ringgold	GA	30736	The Tennessee Valley is one of the most beautiful places and as a healthcare provider, I see people every day that have suffered the long range consequences of decades of pollution. It?s time to invest in the environment and our communities to make the clean and health!
Lindy	Kewatt	Huntsville	AL	35816	Please think about going clean so your great grandchildren can still breath good air.
Barbara	Hollis	Bristol	TN	37620	Because I am a mother and grandmother, I am concerned with the environmental issues involved with coal. I would like a cleaner enviornment for my family than we have now and phasing out coal would be a step towards that goal. We can't just live in the present; we need to plan for the future.
Dianne	Doochin	Nashville	TN	37215	Fossil fuels are in the same category as their source, fossils, as they are dead and no longer useful. Wind and sun are the clean, reliable, low-cost fuel sources of the present and future.

Thomas	Hanks	Franklin	TN	37067	Please continue to be leader in nation's utility industry for innovative practices and the advancement of electricity generation in the 21st century by eliminating coal-fired plants. It will help stop much of the TVA's water and air pollution problem and lower our region's contribution to CO2 production and global warming.
Christopher	Brooks	Knoxville	TN	37919	The recent revelation of how toxic coal ash is to workers and the leakage of toxic chemicals into groundwater near the coal ash site in Kingston are excellent reasons to retire this dirty and outdated technology.
Diana	Page	Nashville	TN	37221	Coal should be left in the ground. Every step of coal use is expensive to people and to the the environment. There are dramatic and quiet examples of these costs. The sooner we move away from coal use, the better for all.
Andrew	Gay	Hohenwald	TN	38462	There are a limited amount of natural resources. I know it will impact negatively in the short term, but it will be worth it in the long term.
John	Guenst	Franklin	TN	37069	It would help my breathing along with patients I treat if we can close these plants. Thanks for considering all the positive outcomes along the monetary savings by stop burning expensive coal
Rickey	Westbrooks	Hohenwald	TN	38462	STOP THE FOOLISHNESS!!!
Ray	Buttram	Mc Donald	TN	37353	We must all be responsible for our environment as producers and consumers. Our children and grandchildren are counting on us to be mindful of our legacy and to instill in them an appreciation for innovative and proactive conservation.
Margaret	Mann	Clarksville	TN	37043	The Ash spill in Kingston and deaths, illness caused by it and cleanup,,,not good! Now ash from New Johnsonville being added to Cumberland City...what about the health of citizens in the area in Alabama where the ash from Kingston dumped.
Stephen	Best	Tellico Plains	TN	37385	Coal and it's waste is an environmental disaster. Please shut your coal plants down And focus on clean energy and I do not mean Nuclear energy.
Stephen	Verran	Oak Ridge	TN	37830	Honestly, in view of the recent climate report, how can you not end fossil fuels? People actually have been and are dying from lung, heart and allergies. Not to mention black lung. People are dying from climate change! WE ALL have to make hard decisions and make changes to save lives!
Rebekah	Gienapp	Memphis	TN	38104	As a Tennessee resident I'm concerned about pollution in our state.
Genie And Bob	Mccombs	Kingston	TN	37763	After living through the largest coal ash industrial spill in History in 2008, we believe it is time to move away from coal plants. Please give this serious thought. Thank you.
Gregory	Lane	Memphis	TN	38115	Explore wind, solar and geothermal solutions ... well before any fossil solutions!
Adrian	Parker	Lenoir City	TN	37772	CLOSE OLD COAL PLANTS !!!
Harriet	Elder	Nashville	TN	37221	And like many others I have asthma which is increased with dirty air like coal. Please retire old coal
Kent	Gardner	Elizabethton	TN	37643	Coal makes a hazardous waste in the air and the burnt byproduct. Time to use renewable energy as a primary source of energy.
Michael	Hollis	Huntsville	AL	35803	The time to do,something is now! And closing these two plants is the right thing to do.
Donald	Keyser	Johnson City	TN	37604	I totally support the retirement of dirty, inefficient coal plants.
Barbara	Kelly	Chattanooga	TN	37412	While closing these costly plants will make a difference to us as rate-payers, I want to point out the savings that will also come to us from better health from less air pollution. Less hospital visits and their bills from asthma, less money spent on medicines, etc. etc. It makes such sense to close them and move to clean energy, which is cheaper and reliable.
Lee	Radford	Birchwood	TN	37308	We will be adding solar to our house to help!
Margaret	King	Cunningham	TN	37052	Not only are you helping Climate Change; you could be saving someone's health, starting with your Employees and the people that live nearest to your plants. Thank-you again for Seriously considering these shut downs. Sincerely; Margaret B King

Laura	Thurman	Oak Ridge	TN	37830	My childhood home was exactly one mile from the Kingston Steam Plant, now known for the horrific coal ash spill. We need clean energy now! We have the technology for wind and solar energy now. We need to overcome the gross ignorance of those who insist on jeopardizing the environment we have to live in with the continuance of dirty coal fossil fuel energy!
Tina	Tine'	Knoxville	TN	37919	Our future depends on renewable energy, and the time to switch is NOW!
Mary Lou	Durham	Nashville	TN	37204	Coal is the wave of an expedient and ultimately dangerous past. It is time to move beyond coal into energy, and less of it for all of us, that is less destructive to the environment as it is gathered and utilized and the waste of which is itself much less toxic.
Ede	Pyle	Nashville	TN	37201	Coal is not the answer to our energy needs! We have cleaner alternatives.
Sonja	Hunter	Lebanon	TN	37090	We need to switch to clean energy. This is a health issue as much as an environmental issue!
Mary Ann	Crowe	Crossville	TN	38571	Procuring the coal is the first assault on the land, and burning it is the second. TVA can be on the right side of history by moving forward, never looking back, and doing the right thing for the health of the Earth and humankind.
Richard	Tittle	Kingsport	TN	37663	I live it, breathe it. Get rid of the coal. Tennessee Eastman Chemical Plant did in Kingsport, Tennessee. They converted ti Natural Gas, cleaner AND less expensive!
Shelia	Mulroy	Louisville	TN	37777	As a mother and grandmother I want to see clean energy being used to protect the environment for our future.
Larry	Dunn	Cleveland	TN	37312	My own COPD compels me to request more effort by TVA, my employer in the 80's, to rapidly add clean, renewable fuels and drastically reduce coal-burning.
Ross	Dawson	Franklin	TN	37064	This is an issue that our family cares deeply about. I became a father this year and it?s time we started thinking more seriously about the future of our children. Please help make Tennessee an even better place to live! Thank you
Harry	Bryant	Dandridge	TN	37725	With climate change finally being accepted by most thinking people it is high time that we take positive action to accelerate the transition to clean energy away from carbon based energy. TVA is in a position to make this happen.
Susan	O'Connor	Cookeville	TN	38506	We have opted to pay extra each month for energy generated by wind. My husband and I are committed to supporting clean energy.
Phillip	Huber	Cookeville	TN	38506	Despite the many attempts to politicize the issue of global warming,it is a threat that has become all too clear in the past few years. We all need to band together to save the future of this planet and I hope the TVA will recognize the dire need to do all they can in switching to clean reliable energy sources. I live in the beautiful state of Tennessee and would love to see this beauty preserved for the next generations.
curt	rookard	Oak Ridge	TN	37830	my family heritage is coal mining for 5 generations, and i want paradise shutdown, and bull run kept at minimum load for grid emergency. i have installed 3.4kw solar and am installing another 6.6kw on the roof of home. tva should get smart and start building solar farms with tesla power banks, additionally have tesla power banks at every single 24000 to 2400 substation in your entire grid, the future is solar, wind and hybrid vehicles, get prepared for it, all of america will be like hawaiis grid, get ready its coming whether you like it or not
Pam	Wallace	Greeneville	TN	37743	Our planet is suffering and needs our help!
Lorene	Nelson	Lenoir City	TN	37771	Killing our environment please stop
J Paul	Moore	Nashville	TN	37221	We must take action to retire coal units. Clean Green energy is the way!
Glynna	White	Harriman	TN	37748	My concern is to protect the environment and produce lower cost of energy
Chet	Hunt	Knoxville	TN	37922	Please lead us to a clean energy future.
Ron	Shrieves	Knoxville	TN	37938	It's imperative that we move away from fossil fuels as rapidly as possible. Not to do so just invites greater disaster levels as climate change accelerates.
Michael	Jones	Kingston Springs	TN	37082	I need to see that even though the federal government is accepting NO responsibility in dealing with climate change it is my hope that local businesses governments and yes, TVA, are ready to do whatever is necessary to deal with this critical problem. In other words, CLOSE BOTH PLANTS!
Sarah	Rowe	Nashville	TN	37215	Please help the Tennessee Valley shift to cleaner energy, such as solar or something else, before it's too late!

Comments Submitted through TVA's Online Comment Management System

Alice	Crocker	Ringgold	GA	30736	As someone who was born in West VA I know no such thing as clean coal. It fouls the air and water.
Kenneth	Bivin	Chattanooga	TN	37405	I feel the pollution issue is one of the most important today, especially for my children. We need to begin acting positively now to ensure the future of our planet.
Gloria	Griffith	Mountain City	TN	37683	Please decide to retire either or, better yet, both of these coal plants.
Hugh	Thomforde	Crossville	TN	38571	The recent 4.4 earthquake centered near Spring City and only a couple of miles from a TVA nuclear power plant prompts me to urge TVA to shift away from both coal AND nuclear power. Despite Trump and other climate change deniers, we must act responsibly in the face of dire consequences for future generations.
John & Pamela	Piccirillo	Huntsville	AL	35801	The message above says everything I feel better than I could express it in other words. Please retire the Paradise and Bull Run coal units!
Linda	Hardy	Nashville	TN	37221	As a mother and hopefully soon-to-be grandmother, I am deeply concerned about the health of the planet we are leaving for our children and grandchildren. Closing these plants would be a step towards providing a healthier earth for them, which I see as an act of love for future generations. Thank you.
Sherry	Knowles	Signal Mountain	TN	37377	Do it TVA! Make us proud. We cannot turn a blind eye to the consequences of unclean air and a carbon glutted climate.
JoAnn	McIntosh	Clarksville	TN	37043	Thank you for moving forward on these plant closures. In light of the latest IPCC report, your leadership in environmental stewardship is vital and much appreciated.
T	Komp	Nashville	TN	37215	You can do the right thing here.
Barbara	Snell	Gallatin	TN	37066	and Gallatin by ?????
Leslie	Forbes	Huntsville	AL	35801	The recent results of climate change reports have put before us a very grim future for our children. Please don?t ignore the scientific results! This is your chance to try abs ensure a future for the human race!
Margaret	Beehan	Nashville	TN	37212	Please clean up our environment.
Dana	Stevens	Sevierville	TN	37862	It is time to end reliance on coal plants. For the health of our environment and human beings.
Cindy	Hintz	Johnson City	TN	37604	We need to be serious about slowing and reversing climate change, and a big part of that requires replacing dirty fossil fuels with clean sources. While clean air and clean water are good for all of us, we need to move the workers in the dirty fossil fuel jobs to new jobs as well. They should not be punished as we move toward cleaner energy.
Cassie	Whited	Wartburg	TN	37887	We need to focus on the long term effects coal burning does to our environment. Our world needs you to make the right decision
Cassandra	Gronendyke	Cookeville	TN	38506	I am proud that such a large percentage of the energy I purchase through TVA is from nuclear or renewable sources, but it is not enough. TVA must be a leader in the transition away from fossil fuels, and phasing out old, dirty, and expensive coal plants is a common-sense way to progress.
Gordon	Schaeffer	White Bluff	TN	37187	The United States needs to focus on cleaner, renewable energy sources.
Carol Michler	Detmer	Murfreesboro	TN	37130	As someone who is extremely sensitive to chemicals and air quality, transitioning to clean energy has a significant impact on my quality of life, as well as length of life. And there are many children and adults who share my sensitivities. In addition, I believe we owe our children and grandchildren a sustainable world. Solar and wind are sustainable, but coal and oil are not over time. Movement to sustainables allows for creation of jobs in the clean energy sector. With training, many can move from unhealthy to healthy jobs.
William	R.	Huntsville	AL	35814	Please switch to cleaner energy.
Carol	Martin	Nashville	TN	37220	We need cleaner air for our grandchilden. I hope other resources like wind can supply energy.
Tristian	Reaves	Athens	AL	35611	It would be a great step in the right direction. Coal is a finite resource that you have to search for by environmentally harmful means. Sun and wind can be found daily without much effort, and without destroying an entire ecosystem.
Cathy	Probst-Walker	Crossville	TN	38572	We need to stop coal production as it is extremely detrimental to environment. We need to embrace green energy and put our focus on that. As evidenced by coal miners getting black lung, it is not "clean" or SAFE. We must try everything to stop contributing to global warming as there will be a point of no return.

Roberta	Stahl	Readyville	TN	37149	Dear TVA Directors, I am the great-grandmother of three. I worry every day about the quality of air that they breath and how bad will it get by the time they are grown. Shutting down Bull Run and Paradise will be a big step in the quest for clean energy. If you have children, grandchldren and maybe even great-grandchildren and you care about them as much as I do mine, there would be no question as to wheather these mines should be shut down. Thank you, Roberta Stahl
David	Kalb	Bristol	TN	37620	Please dump coal as a fuel source. There are many better and greener options. MAKE it work.
Megan	Spooner	Chickamauga	GA	30707	The climate crisis is here and the TVA must innovate and make responsible for choices because it is a public entity. Do the right thing and be a vanguard for the future. PLEASE! --Megan Spooner Chattanooga, TN
Katherine	Sewell	Madison	AL	35758	As an environmental scientist, outdoor enthusiast, and parent, I urge you to protect our air and water quality by phasing out these dirty, expensive power plants and bring the TVA into a better future. We don't need another Kingston. We don't need kids missing more days of school due to asthma or more adults suffering from cardiac events due to air pollution. We don't need to risk our surface and groundwater. Better solutions are ready to deploy, and I urge you to move forward with clean energy.
Sandra	Pulley-Chapman	Millington	TN	38053	We need clean air! Let go of fossil fuels and embrace sustainable energy!
Janice	Kemp	Townsend	TN	37882	As a resident of East Tennessee, a grandparent, and an ardent fan of the GSMNP, I can not help being concerned about air & water quality, as well as, climate change, and their effects on national treasures such as the GSMNP and the health of future generations. We need to face these issues and take immediate action to mitigate these issues by closing old and inefficient and polluting power plants!
Cris	Corley	Lebanon	TN	37087	I personally have a cabin downstream from the Gallatin Steam plant. A lot of my neighbors are concerned about the massive coal ash ponds that are leaking into the Cumberland River. We hope this plant will be closed in the near future.
Marilyn	Finley	Maryville	TN	37803	Isn't it about time Tennessee showed true leadership in clean energy? It has a proud history of being an energy leader.
Trish	Marshall	Nashville	TN	37214	TVA should adapt to using clean energy and stop taking carbon from the ground. Unneccessary!
John	Crittenden	Sevierville	TN	37876	There is no such thing as "clean coal". Coal ash is toxic and people are dying from exposure to it. Carbon dioxide emissions are bringing the planet to the verge of catastrophe. We must reduce fossil fuel use before it is too late.
Steph	Gunnoe	Knoxville	TN	37920	As a Palliative Care professional in the TN Valley, I am familiar with the morbidity and mortality of the Kingston Coal Ash spill clean-up workers. I support TVA in their endeavors to move away from fossil fuels and hope they can lead the way to a healthier energy future for the USA. Thank you for your important work in this tough issue.
Mary	Moore	Clarksville	TN	37043	Clean energy will have great benefits for our citizens (less exposure to air and water pollution) and for our workers - good new jobs in a growing industry. Many coal miners in the Appalachians have serious respiratory diseases resulting from their work exposure. I encourage TVA to close the old coal powered plants and look to the future.
Justin	Higgs	Nolensville	TN	37135	Decommissioning the Bull Run and Paradise coal units is an important first step in TVA?s transition to modern, sustainable energy to power Tennessee and Kentucky through the 21st century. In a world where energy has become politicized by special interest groups, we have forgotten that the TVA brought low cost energy and economic development to the south following the Great Depression. Unfortunately, we are still relying on the same 1960s era power plants and missing out on a revolution in clean power generation. It?s time for the TVA to lead the power industry again by replacing aging and inefficient assets with newer, cleaner alternatives. As a professional engineer and TVA ratepayer, I fully support the on-going decommissioning of coal fired facilities.
Sally	Brown	Oak Ridge	TN	37830	In addition to the environmental pollution aspects of coal, it makes no economic sense to continue using coal when there are less expensive new energy options available.

Jennifer	Ellis	Clarksville	TN	37043	I travel frequently and I am always thankful for the beauty of this state. It has been my home for decades, and I want us to do everything we can to keep it beautiful and inviting for both Tennessee residents and tourists!
Joe	Schiller	Clarksville	TN	37040	I urge TVA to expand its efforts to transition away from coal completely by adding more renewable energy and redoubling its energy efficiency efforts.
Sue	Williams	Memphis	TN	38112	Solar means jobs.
Joshua	White	Ocoee	TN	37361	Please make the smart choice for your rate payers and our environment and transition away from these inefficient, expensive, and outdated coal plants to smarter nuclear baseload and renewable enemy production.
Patricia	Papachristou	Memphis	TN	38111	I wish you would speed up their retirement and hasten the day for TVA to earn the title of renewable energy champion in the US, instead of the champions of dirty coal. In Memphis TVA continued to burn coal for as long as possible before turning to building a nstural gas plant, even though a solar plant would have been much cheaper in the short run and long run. Let's hope TVA doesn?t make the same mistake again ! Pat Papachristou, Memphis, TN 38111
Laura	Lopez Heckhausen	Knoxville	TN	37919	TVA can be a beacon to the state and country that says it has a consciousness about keeping our state green and beautiful. TVA can be formidable as an entity that supports climate change and is working toward saving our environment.
Deanna	Bowden	Brentwood	TN	37027	You have a responsibility to begin to really move our power generation away from fossil fuels. I've attended TVA board meetings and heard board members and high ranking employees say explicitly that coal is becoming more expensive all the time over time, and renewables are becoming more efficient and affordable. The TN valley should not be LAST in energy development.
Lisa	Stalnaker	Knoxville	TN	37932	As a citizen of West Knoxville, I urge you to go through with the closing of Bull Run. The world is moving on from coal, and we need to move with it. The time is now to address the real threats of climate change and take actions to stop its progression.
Dale	Visser	Oak Ridge	TN	37830	I would ideally like to see renewable investment, or nuclear, in order to greatly reduce CO2 emissions.
Rachel	Swinney	Knoxville	TN	37920	I want to be using clean energy...not fake clean coal that removes our mountaintops. Further, we need you to be educating and creating incentives for energy users/the public to want to use less energy. Clean energy sources won't replace all the dirty ones we use...because we use too much. We use more than our share in this country. It is past time, to cut our consumption.
Mark	Bishop	Clinton	TN	37716	As a retired TVA employee, I am greatful for what TVA has done for me and everyone in the Tennessee valley. I had an office at the Bull Run plant, and was very proud to work at one of the most efficient coal plants in the world. But we are now on the steep curve of the exponential advance of climate change. We must rapidly get away from fossil fuels for our electricity. There will likely be some extra initial costs in moving to clean sustainable fuels, but in the long run, it will put TVA in a very competitive position. Please choose to embrace sustainable, clean energy as soon as possible. Thanks for your years of good service.
Joel	Fairstein	Oak Ridge	TN	37830	Please, Let's get rid of coal-fired plants, for our children's health.
Audrey	Williams	Knoxville	TN	37932	Hi, My family has been in coal mining in the past but I know that it is not the sustainable solution we need for our always increasing energy needs. The best thing TVA can do for its service area is increase clean energy and be a leader in sustainable options and reducing energy demand with efficiencies.
Chet	Hunt	Knoxville	TN	37922	Please do not invest anymore in obsolete energy production. The age of fossil fuel is wanning and we must position ours lves for the inevitable transition to clean energy. More solar, wind and non carbon sources is what we need to invest in.
LYDIA	PULSIPHER	Knoxville	TN	37914	I am the widow of a one-time TVA chief economist. He was always concerned about TVA's lack of attention to pollution responsibilities. Please see if you can't clean up TVA's record, now.
Carol	Montgomery	Concord	TN	37934	Clean energy is so important to our health in E TN. And will make money for TVA in the long run. Please take notice of this.
Ron	Buck	Memphis	TN	38117	Go solar. Clean and reliable.

Alice	Feldman	Oak Ridge	TN	37830	It is shameful how regressive TVA has been in manufacturing clean energy for so many years. Even aside from the disastrous coal ash spill, coal mining continues to cause black lung disease and to endanger the employees. Coal burning pollutes our beautiful valley with fly ash and to harm the residents of the area. It is long since past time that we discontinue the mining and use of coal to produce energy. Coal mining companies should already be well on their way to developing clean and renewable sources of energy for the residents of the Tennessee Valley. I applaud TVA's decision to retire these coal units, and I urge you to continue on this course without further delay. The people of the Tennessee Valley deserve a clean environment and clean energy.
Maureen	Lorenzen	Rocky Top	TN	37769	As a member of the health care profession I also believe that the cost to workers' health is too high. Jobs are healthier and competitive in renewable energy and the long term cost would be lower than that of caring for disabled mine workers.
Neranza	Blount	Knoxville	TN	37931	I see the constant smoke billowing out from Bull Run every day as I live near by. It's time to display an effort in helping us live on a clean planet. It starts here at home. Be praised for your example and lead the way to encourage others. Our children, grandchildren and future generations require it. Thank you!
Melanie	Harless	Oak Ridge	TN	37830	We need to do this for our children and grandchildren.
Jeremy	Cifaldi	Memphis	TN	38112	Sustainable, carbon-free energy is the future. Please close Bull Run and convert to renewables.
Carol	Smith		TN	37849	I agree that we have to move toward cleaner energy. We are destroying our planet, and scientist are making this clear...change has to happen.
Todd	Waterman	Clinton	TN	37716	It's ironic that Oak Ridge, the home of world-leading research on climate and renewable energy, must still be powered by antiquated coal, the most polluting energy source of all. We and TVA are responsible for Bull Run's annual 2,993,904 tons of CO2 - an irrevokable environmental and economic curse on ourselves and every human to come, as this recent cost-benefit analysis in Nature makes starkly clear: https://www.nature.com/articles/d41586-018-05219-5
Cheryl	Myers	Clinton	TN	37716	Living near Bull Run my whole life has been a sad window into the reality that our world is not clean. Make a difference. Do better because you know better. Because the educated scientists among us know the reality.
Debbie	Painter	Powell	TN	37849	When I used to travel to West Tennessee as a state employee, I was always discouraged when I returned east and began to see the darker sky about the time I reached Kingston. As a person with allergies and breathing issues, I would love to see our air as pure and clear as possible. That could add years to my life.
Allison	Wolf	Oak Ridge	TN	37830	I live right near the Bull Run power plant, and worry about the air around here. My husband is asthmatic, and his asthma has worsened since we moved here. I'm also concerned about the possibility of coal ash spills. We have so much pollution here in Oak Ridge from power production and from the Manhattan Project! I'd love to see us move towards cleaner power sources, and there's a lot of enthusiasm for cleaner power here in Oak Ridge proper.
Sue	Chard	Portland	TN	37148	To end the fossil fuel industry is to finally step out of the past and into the future.
Tanner	Jessel	Knoxville	TN	37917	We need to move away from coal. The sooner the better. Please invest in renewables. China is testing floating solar panels. Seems like a good fit for TVA with its many reservoirs.
Barbara	Bridges	Knoxville	TN	37918	We only have a limited time to act if we are to prevent the worst impacts of climate change within our region and globally. We MUST divest completely from Fossil fuels NOW. Keep it in the ground!
Laurel	Bowen	Powell	TN	37849	As a grandparent, I feel it is my job to provide a safe, healthy, resilient world for my grandchildren. We need to sacrifice now for their future. But I also feel that jobs in the new clean energy industries are what we need now to grow our economy and provide for our young people.
Leigh	Garrett	Powell	TN	37849	It is time for clean energy! Please close Bull Run and Paradise coal units. It is the responsible and right action to take!
Randal	Graham	Knoxville	TN	37932	I am particularly concerned about the coal ash storage problem, in view of what has happened before. I am also in favor of breathing clean air, and not having our mountain views fouled by coal fired power plants.
Jill	Salmen	Oak Ridge	TN	37830	Clean energy is the future.
Gerry	Moll	Knoxville	TN	37917	Any nuclear plants that we could shut down along the way would also be welcomed.
Mary	Headrick	Maynardville	TN	37807	Coal is dangerous to our health and to our planet. I am leased with the proposal to retire these two plants.

Hope	McAtee	Oak Ridge	TN	37830	I am a resident of Oak Ridge one town over from Clinton. With a teenage daughter and our use of Melton Lake and Clinch River with our kayaks we are extremely aware of the possible environmental impact that Bull Run does and could have in the future on our local area. I would like to look for more innovative and clean energy options. As a resident of the Secret City I believe there are better options available long term to protect the beautiful outdoors, our water table, lakes and rivers. Green energy is the future and we need to be a part of ours growth in our area. Please take our future into consideration. Hope McAtee
Connie	Myers	Oak Ridge	TN	37830	We need clean energy.
Will	Kidd	Knoxville	TN	37923	Please stop using coal
Joni	Pinker	Knoxville	TN	37909	Sooner is better, for all of us.
Sam	Dornan	Franklin	TN	37064	Climate change is very important to me. As a Tennessee resident who receives power generated by TVA, I want the power I use to be renewable and not affect our climate.
Sarah	Wilson	Somerville	TN	38068	Sarah Wilson
Patti	Oliver-Moseley	Lancaster	TN	38569	Let's step into the future like other countries have to protect our natural resources with clean energy.
Katie	Herzig	Nashville	TN	37212	We have so little time to phase out fossil fuels in order to save this planet from catastrophic climate change. The only time to start is now and I am so encouraged that TVA is going to possibly phase out coal. Other states have shown us they are committed to clean energy and we must rise with them. Anything less than 100% clean is not enough in my opinion. thank you.
Garry	Ballard	Nashville	TN	37210	Planning for a true 21st century energy system should only include green sustainable energy production technologies.
Tommi	Stephenson	Nashville	TN	37218	If there is danger in the waste, that is not a viable energy source. It's time to stop punishing solar and start serious incentive programs. It's time to invest in wind and hydro. Tennesseeans deserve better.
Amber	Lee	Brentwood	TN	37027	I want my children to be able to grow up and breathe clean air. I want there to be a healthy planet in 50, 100, 1000 years from now.
Beverly	Morris	Chattanooga	TN	37419	Please make Tennessee a leader for clean energy. Many solar plants are starting to pop up, and I am in favor of this source.
Joe	Alegre	Chattanooga	TN	37411	As a person who lives in TVA country and has worked for TVA in the past ...I want TVA to be a beacon of clean energy initiate going forward and the removal of two coal powered plants is a good opportunity to shine.
Ruth	Songer	Fairview	TN	37062	Our children are in need of clean energy!! Even yours!
Mary	Jenkins Kline	Smyrna	TN	37167	We need to have clean energy it?s available now Geothermal and solar panels and in some areas Wind Mills. I own a building in Nashville and have had all of the above with exception of the windmills. We have saved so much money and energy All you have to do is decide now is time for Change
Patrick	Ferrell	Nashville	TN	37204	Coal is not only no longer economically viable, but we have a moral obligation to transition to clean energy as soon as possible for our children
Mayme	Siders	Clarksville	TN	37043	In light of the most recent reports on climate change I believe it is IMPERATIVE that coal plants be phased out as soon as possible. Please vote for future generations by shitting these down now -
Brian	Paddock	Cookeville	TN	38501	Actually sooner would be better. The costs and dangers of coal ash landfill isolation and the clean up of legacy ponds is already in the Billions. The sooner TVA stops making this toxic ash to more we will save. If TVA would encourage more small scale solar installations, which are paid for by home owners & small businesses, the quicker we get to energy that is free of fuel costs & dangerous wastes.
Janice	Saylors	Rock Island	TN	38581	We moved to Tennessee because we love the beauty of this rural area. Preserving this beauty and a healthy environment for the next generations should be a primary objective of the TVA.
Sharon	Lyons	Allardt	TN	38504	We need clean in our home stay!!!!

Brandon	Powell	Nashville	TN	37214	Clean Energy should be just plain common sense by now. But you guys already know all that. And you guys already know what the "Power" companies are all about. And you guys already know we could've been on clean free energy my entire life. So since you already know please do your best to do what's in your power to push back against power in support of your people and your planet. Illusory profits at the expense of people and planet is SIN and you'll go thru hell because of it. Do your best. Thanks.
James	Bland	Millington	TN	38053	Please realize that countless people being served by TVA and other utilities live and die with COPD and countless other diseases. Let's get serious about giving cleaner air and water for future generations. Thank you for considering healthy and economical answers for all our futures.
Laura	Bledsoe	Bartlett	TN	38134	Dear TVA, my brother in law is Paul Harris from Tennessee he is a former vp for mlgw and past pres of Chickasaw electric. He has a great plan for turning garbage into fuel. Sludge plant. I hate coal!!!!!!!!! Use our intellect to create better energy now
Jack	Bishop	Bartlett	TN	38133	Coal fired plants are killing workers and Americans who live in the path of the byproduct of this poison. People have been burning coal for thousands of years. We have a hi- tech society but are still dependent on killer coal. The question isn?t why but who is profiting. Follow the money is still the best way to expose those that ignore the facts and continue to Murder coal workers and their families?
Kyle	Howe	Knoxville	TN	37917	Please invest in clean air for our communities future!
Jill	Empey	Knoxville	TN	37932	Please! For the love of god and all that is good the this world , Clean Energy Now! Our children?s children will be so thankful.
Neva	Stephens	Clarksville	TN	37040	We must get real about our impact on the environment we must deal with this issue in real ways. I have children grandchildren and great grand child they are inheriting our garbage our mistakes think of the futur generations. We must be mindful of what we produce as waste please we can do better. The time is now not tomorrow or we may not have that many tomorrow?s I do all I can to limit my foot print but I am just one person it takes a global village and you could be part of the solution. Thank you I am praying for solutions sincerely Neva Stephens
Sharon	Bowers		TN	37644	Having taught for 32 years, I've seen the effects of air pollution on generations of children. Watching an innocent child gasp for breath and turn blue as you scramble for their meds is a life-altering event. It is one that should NEVER happen. Please consider this when making your decisions. Thank you for reading. Sharon L. Bowers
Nancy	Pryor	Knoxville	TN	37902	I hope we can focus on clean energy in East Tennessee to keep our area beautiful for us and our children to enjoy and treasure.
Sharon	Vaughn	Sale Creek	TN	37373	Retirement of all these coal plants is overdue. Even as a TVA retiree I support the closure of all the old plants. They have long outlived their life expectancies and coal ash is an additional threat to our environment as Kingston spill showed.
Barbara	Sherrill	Crossville	TN	38572	We need to keep our atmosphere as clean as possible especially for our future generations of grandchildren & great grandchildren
Charles	Baggarly	Owensboro	KY	42303	Thank you. We will all breath better.
Jennifer	Kaminski	Owensboro	KY	42301	Clean energy is required for the future health of our people and our planet. Kentucky can be a leader in the transition. Help our residents transition to clean energy power and clean energy jobs.
Kay	Clark	Bowling Green	KY	42103	Since Trump has drastically cut what the EPA should be doing to protect us from our environment, I feel like the proposed change regarding coal would be a great benefit to our environment and health.
Sam	Webb	Knoxville	TN	37921	Its already done so much enviromental damage its a hell hole for workers. Environmental damage is devastating from fossil fuels yet or leaders still insist its fake news. Hope itz not to late for to little.
Deborah	Stevens	Bowling Green	KY	42101	When you stop using coal and go to a clean energy source you will help slow the global warming. I personally will be greatfull.
Jill	Alliman	Sweetwater	TN	37874	Clean alternative energy is the direction TVA should be going in. It will create more jobs and protect our environment for oyr children' children. Support Green power now! In a big transformative way! Thank you.
Daniel	Swink	Memphis	TN	38117	I care very deeply about the world that we are passing on to our children. Clean air and clean water are extremely important and, as adults, we have a responsibility to preserve our environment right now and in the future. Thank-you.

Elena	Williams	Memphis	TN	38107	Please support clean air by shutting down these dirty coal plants!
Bonita	Ladich	Maryville	TN	37803	In addition to the environmental impact of coal production has been the human cost to coal miners whose health and well-being seem to have been of no consequence.
Richard	Davis	Memphis	TN	38104	I think the use of clean energy without using coal is a wonderful thing.
Forrest	Brown	Nashville	TN	37209	Tennessee needs to transition to renewable energy and more nuclear energy as soon as possible. If we don?t act now, future generations won?t be able to enjoy Tennessee as we do now. For that matter, WE won?t be able to enjoy Tennessee as we do now. The climate is in crisis, and I do not want to see environmental catastrophe and the collapse of civilization within my lifetime.
Ann	Bishop	Millington	TN	38053	It is my wish to leave our children & families with the best environment possible. Doing everything we can to improve our air quality will work towards that end. It is a known fact that coal is detrimental to clean air.
Chandra	Summitt	Knoxville	TN	37901	Look at Bangladesh from satellite view, then get back with me.
Bobbi	Stout	Knoxville	TN	37922	This is about all our futures! What will history say of us , if we even make it another 100 years . Do the right thing !
Clay	Holdford	Lakeland	TN	38002	It's time to rid Tennessee of coal an its polluting byproducts. Keep our air, waters and aquifers clean for our present and future generations.
Rebecca	McMurtry	Hendersonville	TN	37075	Moving to clean/renewable energy sources would help keep TN beautiful, the landscapes full of life, clean air and water.
Antoinette	Olesen	Nashville	TN	37205	My dear sister died of lung cancer from pollution. She was a healthy living non smoker. Devastating our family she left two children and a grieving husband. We will save on health costs, worker productivity and create quality of life. For everyone?s sake Let's have TN on the cutting edge of clean air and water. Clean renewable energy will create jobs and attract businesses and increase tourism. Let's make the news for our forward movement in creating a clean, healthy beautiful environment. Thank you for your support in closing these antiquated coal plants. Antoinette Olesen, home owner/ voter
Joan	Laney	Memphis	TN	38112	Our children need to inherit an earth that is healing and not ravaged. Please think of the next 7 generations and act with them in mind.
Kelly	Johnson	Bulls Gap	TN	37711	Please help to ensure that our two great States do their part to help combat pollution and fight global warming. The science is clear and the time to act is now. We must put an end to carbon emissions and embrace clean energy. The switch to clean energies is a win for everyone- our health, our children?s future, our economy, our wildlife and our planet will all benefit.
Kathleen	Mcintyre	Philadelphia	TN	37846	Thank you for removing a terrible health hazard!
Jan	Berry	Greenback	TN	37742	TVA demonstrates leadership with 50% clean energy supply with 48% of that clean energy coming from nuclear power. TVA can expand this leadership by shutting down coal fired power plants as soon as feasible. Recent emphasis on black lung disease, and coal ash spills add to the dire consequences and risk of coal. It is well known that carbon emissions from coal fired plants cause global warming as well as release of fine particulates, radioactivity and mercury. The International Panel on climate change clearly states that action must be taken within 12-years to mitigate the worst effects of climate change. I strongly urge you to shut down these coal fired power plants.
Cyndi	Chester	Charlotte	TN	37036	Please, shut these major climate change contributors down.
Dave	McIntyre	Philadelphia	TN	37846	I'm pleased that TVA is considering removing a health hazard and cleaning the atmosphere. This comes from one who suffers from airborne pollution.
William	Wilkin	Nashville	TN	37221	I don't want my kids to breathe dangerous air like they do in China.
James	Wasilew	Louisville	TN	37777	I'm glad TVA is getting away from coal. I only wish all the coal ash these plants have produced over the years could be put back in the mine that the coal came from. At the mines expense.
GINGER	COGGINS	Germantown	TN	38139	We want to breath better air and leave a better planet for our children. This is so important fir their future snd we all must care nice!
Lisa	Parkes	Johnson City	TN	37604	There is no such thing as clean coal. I applaud your decision to shut these down. Thank you.
Elizabeth	Minter	Murfreesboro	TN	37130	I want my grandchildren to live with clean air!

Karen	Hardin	Greeneville	TN	37743	I support clean energy!
Patrick	Watermeier	Memphis	TN	38111	Please support the necessary transition to renewable energy. I believe the public will respect the TVA much more for doing so. Coal is not environmentally healthy, socially sound, or even economically wise. Thank you for reading and choosing responsibly.
Jane	Hudson	Memphis	TN	38128	Yay and no more ash spills.
Melina	Sierra	Nashville	TN	37210	It is imperative that we make the switch to clean energy for the health of ourselves and all species on the planet.
Jane	Hudson	Memphis	TN	38128	Yay and no more ash spills!
Patrick	Watermeier	Memphis	TN	38111	Please support the transition to renewable energy. I believe the public will admire the TVA for acting responsibly during this time. Coal is not environmentally healthy, socially sound, or even economically wise. Thank you for reading and choosing clean energy.
Mark	Vancil	Germantown	TN	38138	PLEASE get us off of non-renewable energy!!
Elizabeth	Hagan	Franklin	TN	37064	Let's move to the Future!
Kathy	Knudson	Chattanooga	TN	37403	Please help our planet remain healthy.
Michael	O'Connell	Nashville	TN	37211	Our jewel of a planet, our home, needs your help. Please phase out these two plants and replace them with clean energy sources. Thank you!
Mary	Reed	Chattanooga	TN	37411	Living here in the middle of TVA-land makes your actions to clean up the environment mean so much more personally .
Carolyn	Sheehan	Bowling Green	KY	42104	The negative impacts of coal extraction on the environment and the detrimental consequences to coal miners should also be a consideration and impetus for the timely transition away from the antiquated use of coal as an energy source.
Linda	Utley	Camden	TN	38320	Our country need to get on board with renewable energy. It will be a lot better for our planet and the inhabitants of this planet.
Jon	Watts	Brentwood	TN	37027	Tennesseans deserve clean air.
Anne	Parker	Nashville	TN	37207	Not' retiring these coal plants, actually, is not an option. There comes a time when we have to think in the bigger picture as to the impact this is having on our environment. People who have worked hard making a career in the business of coal, do need to be somehow compensated/ taken care of and Let's start by stopping and hearing an apology from those responsible for giving financial breaks to businesses as incentives and then putting it on the other hardworking and struggling individuals with whom absorb this absurd financial break given.
Paula	Ladd	Nashville	TN	37206	Anything you can do for air and water quality is crucial!
Sherry	Allen	Erin	TN	37061	I?ve been saying this for a long time. Just retrofit the plants to solar and wind energy. It will definitely help our planet earth in the long run.
Pat	Combs	Chattanooga	TN	37405	Please help us rid the environment of pollitanta and encourage clean energy
Sarona	Austin-Owens	Owensboro	KY	42301	We only have one home, obviously we all need to take care of it for our future generations.???
Dennis	Williams	Memphis	TN	38134	I have 2 grandchildren. They love the outdoors and are just now learning things that you can only learn by walking, swimming and bring outside. Please do your part to ensure future generations have the opportunity that I had to learn how important our environment is to all. Dennis Williams BS Biology and Grad.school Marine Biology candidate
Anna	Hogan	Memphis	TN	38112	I have grandchildren who live in Knoxville and Memphis who suffer with asthma and clean air is vital, not only for them, but every living creature. It is vital that we do everything we can to make our air cleaner so I urge you to please close down coal burning plants and pursue options that make it healthier for everyone to breathe. Thank you, Anna Hogan
Sean	Siple	Joelton	TN	37080	Let's think of the generations to come. I appreciate all you can do to help keep some clean air and water.
Elizabeth	Stein	Nashville	TN	37221	It's time to phase out coal and move to more sustainable and environmentally friendly energy sources.
Vance	Sterling	Tallassee	TN	37878	It's time to show Trump the people want clean energy not his filthy old ways.
Richard	Spry	Murfreesboro	TN	37128	Coal plants are poisoning our air and water. We can?t afford to continue using these plants. The cost to human and environmental health is too great.
Corinne	Adrian	Memphis	TN	38104	Be environmentally aware and use clean energy.

Cassie	Bell	Arlington	TN	38002	I have friends that lost parents to those coal plants. Not a good report card.
Anne	Hill	Nashville	TN	37205	Whatever you can do to alleviate environmental damage is worthwhile. I say this as a lifelong amateur ornithologist. And I hope the health of those who mine coal will be improved when coal is phased out.
Suzan	Fleischman	Memphis	TN	38107	For years during a Republican reign there is little concern for our great land. Our environment should be protected at all times. That?s our TOTAL environment. It?s unforgivable to continue destroying our land and our loving nature. The destruction always has consequences, be it the health of humans and creatures and more. Just Senseless.
Robert	Seyer	Cleveland	TN	37311	As a resident of Tennessee I support the move toward clean energy and finding more environmentally friendly ways to produce energy.
Ingrid	Graudins	Old Hickory	TN	37214	Our time is running out to save this planet for future generations ? please think long term and do the right thing.
Don	Owen	Murfreesboro	TN	37128	My family and I are appreciative of your efforts to make our environment cleaner, healthier and safer.
Loretta	Farmer-Brown	Memphis	TN	38104	Please be a positive force for the residents of Tennessee as well as an inspiration to others in power that could also effect positive environmental change in this country. Thank you.
Sharon	Pollis	Sale Creek	TN	37373	Clean energy is the way to go for a better America and world. We have the technology and can employ and train former coal mine workers!!! Getting rid of old coal mines is a step toward a cleaner environment, better health for workers, and a bright future for the next generations to come! Thank you!!!
Angeline	Fitzpatrick	Knoxville	TN	37917	We value clean air and water and know there are options available that are healthier for us and our planet.
Charles	Beck	Chattanooga	TN	37419	Please do your part to clean up our environment. Our health depends on it. Thank you.
Richard	Edwards	Milligan College	TN	37682	Look at Costa Rica, there's a lot to learn from their transition. I'd like to see retraining of existing employees, their involvement and input.. from teardown of existing systems, remediation of sites to building and operating Wind, Solar at those locations.
Sharon	Holmes	Elizabethton	TN	37643	East Tennessee deserves to be treated fairly. TVA did many wrongs to the people here. It is time to correct your misdeeds .
Joanne	Irvin	Rogersville	TN	37857	I am delighted that TVA has proposed a plan to close down the Paradise and Bull Run Coal plants. Coal is devastating for our fragile environment. The future is solar and wind producing energies. I?m proud of TVA.
Alexis	DeCaprio	Delano	TN	37882	The air quality decreases in the smoky mountains every year. The proposed change-over deadline is not soon enough.
Kristina	Counts	Franklin	TN	37067	I am a mom and a preschool teacher living in Franklin, Tennessee. I am very concerned about our children?s future here in Tennessee and in the world. Children are especially vulnerable to mercury and chemicals and I feel the closing of these plants is in kid?s best interest. Transitioning to clean energy will promote jobs and a sustainable future environmentally and economically. It will ensure our kids have a clean environment and that the climate crisis will be lessened with green energy replacing fossil fuels. Please develop green energy jobs so TVA employees can have a just transition in making this change. We all benefit from green energy environmentally and economically. Thank you.
Sally	Grady	Cumberland City	TN	37050	I live two miles from the Cumberland City TVA and I am very concerned about the quality of our air and water. Coal needs to be retired for the sake of our planet and for the health of coal miners too. My former husband is just 60 years old and is dying of black lung from his career as an underground coal miner. There are cleaner sustainable options. Please let this century be the century of change, for the good of the planet and for mankind.
Tim	Morgan	Gallatin	TN	37066	The sooner we can transition away from coal the better. I strongly support any effort such as this to close coal plants and transition our area and TVA?s energy portfolio to cleaner and more economical options. The White House?s push to support and revive coal isn?t in our nations or the environments best interest.

Erica	Anderson	Nashville	TN	37208	Dear TVA, I am an 8th generation Tennessean. My grandmother retired from TVA/the Army Corps of engineers. I teach science in a Title I school. I have family in rural regions of East and West TN. Tennessee runs in my bones and blood and as a scientist, a Christian, and a justice advocate I believe that it is time to phase out fossil fuels and coal. It is past time and we are running out of time to act. Please move forward with the retirement of the Paradise and Bull Run coal units-- and furthermore with other fossil fuel and coal power sources. I want to make sure the TN and Southeast I know, love, and that my ancestors have shared with me is also available for future generations.
Cori	Macnaughton	Doyle	TN	38559	Yes, please and thank you, your efforts to scale back our use of coal and replace it with renewable energy is much appreciated, and long overdue. Please step up the time frame in Tennessee as much as is possible. Thank you.
Marcia	Gray	Hendersonville	TN	37075	It?s an easy decision - if you think only of what?s good for your grandkids!!!! Marcia Gray
Ashley	Woods	Brentwood	TN	37027	We need renewable sources of clean energy now more than ever. It matters for the air we breathe and water we drink!!! This effects everyone.
Karen	McIntyre	Nashville	TN	37217	We must move to renewable sources of energy....yhis is a no brainer!
Sarah	Foster	Germantown	TN	38138	As a young person in 2018, protecting the future for myself and my children is extremely important. I do not want to live in a polluted world nor do I want anyone that follows after me to have to deal with problems we created.
Cathy	Walsh	Elizabethton	TN	37643	I believe that clean energy is the future for energy production. It would help create more jobs and stimulate the development of new technologies in the United States, which would help us remain on the cutting edge of the global market, instead of relying on a resource that deLet's our natural resources and destroys our natural habitats through such practices as mountaintop removal. Closing these two coal units could be a first step to ensuring that future generations will be able to appreciate and enjoy the splendor of our natural world.
Priscilla	Stinson	Memphis	TN	38127	I vote for clean energy because it is essential to our health. The cleaner our air the longer we live.
Lawrence	Creech	Oak Ridge	TN	37830	CO2 emissions have to stop. Solar means distributed capacity and distributed jobs.
Marc	Tucker	Johnson City	TN	37601	We need to invest in jobs of the future and ensure communities which currently rely on coal plants are going to be ready for jobs of the future. Please invest in green jobs and clean energy production.
Stephanie	Norwood	Memphis	TN	38107	In addition the coal ash pits are a danger to TN auquifers which supply some of the purest drinking water in this country. It is time for this change: cleaner,safer, reliable, low cost. Let's do this!
Mary	Egger	Memphis	TN	38111	We are WAY past the time for getting rid of dirty energy sources !
Bradley	Mullins	Rutledge	TN	37861	I "Do Not Support" Any phasing out of power plant facility!!! Repeat I DO NOT SUPPORT ANY PHASING OUT OF ENERGY PRODUCING PLANTS, THAT BURN COAL COAL!!!
Bethany	Joy	Nashville	TN	37211	This makes me so hopeful!!!! Thank you for having long-term vision in thinking of our FUTURE and not only the present. Bless you all.
First_tennessee	Last_tennessee	Chattanooga	TN	37412	
Perry	Chapdelaine	Ashland City	TN	37015	
Henry	McKennon	Huntsville	AL	35805	
Tom	Westlake	Huntsville	AL	35810	
Suzanne	Cooper	Nashville	TN	37215	
James	garland	Knoxville	TN	37916	
Kristin	Ford	Bowling Green	KY	42101	
Destiny	Johnson	Gainesboro	TN	38562	
Bobbie	Hensley	Greeneville	TN	37743	
Amy	Zielinski	Crossville	TN	38571	
Jeff	Kulas	Murfreesboro	TN	37130	
Scott	Gaddis	Chattanooga	TN	37405	

Troy	Bidwell	Knoxville	TN	37934	
Dr. Peter L.	Corrigan	Starkville	MS	39759	
Rose	Hirschy	Hermitage	TN	37076	
Elizabeth	Floersch	GoodLet'svlle	TN	37072	
Margaret	Dube	Memphis	TN	38120	
Charleen	Shelton	Crossville	TN	38572	
Craig	Drew	Chattanooga	TN	37421	
Bonnie	Swinford	Knoxville	TN	37917	
DAVID	RIALL	Chattanooga	TN	37412	
Heather	West	Kingston	TN	37763	
Vicki	Wade	Memphis	TN	38119	
Barbara	Prince	Johnson City	TN	37604	
Alyssa	Matas	Chattanooga	TN	37415	
Lynn	Ellis	Knoxville	TN	37918	
Bill	Baeder	Hendersonville	TN	37075	
Louminda	Torbett	Maryville	TN	37801	
Paulette	Walton	Butler	TN	37640	
Corey	Chatis	Nashville	TN	37206	
Melvin	Hughes	Sparta	TN	38583	
Cheryl	Dare	Memphis	TN	38104	
Linda	Newkirk	Huntsville	AL	35824	
William	Vinett	Nashville	TN	37211	
Jacki	Masar	Louisville	KY	40291	
Joyce	Grimes	Memphis	TN	38127	
Mark	Blazer	Seymour	TN	37865	
Hector	Bertin	Whiteville	TN	38075	
Jason	Smith	Knoxville	TN	37921	
Carol	White	Scottsboro	AL	35769	
Nathan	Ottinger	Greeneville	TN	37743	
William	Franks	Nashville	TN	37205	
Julia	Jardine	Lebanon	TN	37090	
Jean	Johnston	Decatur	TN	37322	
Pamela	Thompson	Memphis	TN	38128	
Linda	Inness	Philadelphia	TN	37846	
Alison	Eddy	Starkville	MS	39759	
Leonard	Wolf	Nashville	TN	37203	
Suzanne	Silva	Franklin	TN	37069	
Michelle	Phillips	Franklin	TN	37069	
Mark	Phillips	Franklin	TN	37069	
Chris	Drumright	Murfreesboro	TN	37130	
Kim	Wheetley	Chattanooga	TN	37415	
Justin	Wesche	Memphis	TN	38119	
Betty	Anderson	Bowling Green	KY	42103	
Kendall	Wimberley	Knoxville	TN	37920	
Alice	Hudson	Lakeland	TN	38002	
Ann	Douglas Tycer	Brentwood	TN	37027	
Robert	Winkler	Oxford	MS	38655	
John	Noel	Nashville	TN	37215	
Robert	Benson	Lebanon	TN	37090	

Julie	Richardson	Memphis	TN	38112	
Charlie	Palmgren	Franklin	TN	37064	
Lynn	Hardiman	Smithville	TN	37166	
Catherine	Kalinowski	Hixson	TN	37343	
Shelby	Hood	Franklin	TN	37064	
Kristina	Baker	Southaven	MS	38671	
Aaron	Meier	Nashville	TN	37209	
Sue	Umbarger	Summertown	TN	38483	
David	Butler	Hermitage	TN	37076	
Tonda	Bailey	Knoxville	TN	37931	
Steven	Morris	Sevierville	TN	37862	
Larry	Wenger	Cleveland	TN	37311	
Darrel	Easter	Bartlett	TN	38135	
Susan	Schuchard	Nolensville	TN	37135	
Mace	Clarridge	Hixson	TN	37343	
Frances	Paris	Woodbury	TN	37190	
Linda	Tift	Chapel Hill	TN	37034	
Linda	Kaplan	Germantown	TN	38138	
Louise	Palazola	Memphis	TN	38117	
Joshua	Castle	Clarksville	TN	37042	
James	Thoman	Hermitage	TN	37076	
Connie	Stapleton	Chuckey	TN	37641	
Calvin	Schmid	Johnson City	TN	37615	
Alan And Andree	Lequire	Nashville	TN	37209	
Deborah	Allison	Shelbyville	TN	37160	
Chester	Mcmillin	Memphis	TN	38135	
Susan	Courtney	Andersonville	TN	37705	
John	Reid	Mountain City	TN	37683	
Betsy	Bucy	Madison	AL	35758	
Patrick	Benjamin	Corryton	TN	37721	
Eric	Hanson	Nashville	TN	37216	
Debra	Hanahan	Franklin	TN	37067	
Kathryn	Sullivan	Huntsville	AL	35811	
Barry	Medlin	Oak Ridge	TN	37830	
Mary	Bristow	Brentwood	TN	37027	
Norman	Vaden	Byhalia	MS	38611	
Helmut	Steinberg	Memphis	TN	38103	
Jonathan	Mitchell	Madison	AL	35757	
Jonathan	Holland	Crossville	TN	38571	
Jessica	Hoover	Knoxville	TN	37918	
William And Virginia	Kennedy	Jonesborough	TN	37659	
Elliott	Bales	Hixson	TN	37343	
Chris	Dacus	Bell Buckle	TN	37020	
John	Marable	Memphis	TN	38122	
Angela	Hibbitt	Milan	TN	38358	
Sharon	Lyons	Allardt	TN	38504	
Roger	Guth	Brentwood	TN	37027	
Michael	Serkownek	Maryville	TN	37801	
Cindy	Hatcher	Bumpus Mills	TN	37028	

Mary	Reed	Lancing	TN	37770	
Pete	Garland	Signal Mountain	TN	37377	
James	Marziotti	Andersonville	TN	37705	
Dan	Bourrie	Decatur	AL	35603	
Stephen	Nemecek	Chattanooga	TN	37403	
Sharon	Turco	Germantown	TN	38138	
Ben	Sugg	Maryville	TN	37803	
Nikki	Brewster	Oak Ridge	TN	37830	
Patricia H	Williams	Nashville	TN	37209	
Eileen	Gonzales	Cleveland	TN	37323	
Michelle	Jones	Hixson	TN	37343	
Jim	Barritt	Shelbyville	TN	37160	
Connie	Myers	Oak Ridge	TN	37830	
Tina	Tine'	Knoxville	TN	37919	
James	Harrell Jr	Murfreesboro	TN	37127	
Phyllis	Golden	Memphis	TN	38108	
Sophie	Statzel	Nashville	TN	37206	
Veronica	Bourassa	Evensville	TN	37332	
Patricia	Dishman	Nashville	TN	37221	
Kenneth	Reece	Knoxville	TN	37922	
Adrienne	Frey	Franklin	TN	37069	
Nathalie	Hartert	Nashville	TN	37212	
Monica	Juma	Memphis	TN	38103	
Terry	Risner	Mount Carmel	TN	37645	
Eric	Robinson	Memphis	TN	38104	
Rhonda	Bradley	Crossville	TN	38555	
Sheila	Lott	Jonesborough	TN	37659	
Karl	Flaucher	Huntsville	AL	35811	
Barbara	Means	Murfreesboro	TN	37128	
Tracy	Pedersen	Huntsville	AL	35806	
Dexter	Craig	Oak Ridge	TN	37830	
John	Carr	Nashville	TN	37221	
J D	Cooper	Memphis	TN	38104	
Joyce	Wilding	Kingston Springs	TN	37082	
Robert	Fingerman	Monteagle	TN	37356	
Jan	Mitchell	Hendersonville	TN	37075	
Gail Marie	Noon	Ringgold	GA	30736	
Karen	Neubauer	Huntsville	AL	35801	
Barbara	Allen	Knoxville	TN	37921	
Gina	Turner	Memphis	TN	38122	
Tracy	Brown	Lenoir City	TN	37772	
Gilbert	Gallagher	Loudon	TN	37774	
Timothy	Kent	Knoxville	TN	37934	
Barbara	Addis	Knoxville	TN	37931	
Lynda	Snook	Kingsport	TN	37660	
Karoline	Novilla	Jefferson City	TN	37760	
Nancy	Beavers	Woodlawn	TN	37191	
Hiasaura	Rubenstein	Nashville	TN	37205	
Ann	Lane	Huntsville	AL	35802	

Kelly	Eagar	GoodLet'sville	TN	37072	
Nigel	Bowen	Lakeland	TN	38002	
Steven	Scheer	Germantown	TN	38138	
David	Olive	Antioch	TN	37013	
Toya	Hibbs	Clarkrange	TN	38553	
Charles & Dinah	Crow	Cumberland City	TN	37050	
Courtney	Oldendorf	Powell	TN	37849	
John	Wyatt	Tellico Plains	TN	37385	
Ronald	Whitmore	Alvaton	KY	42122	
Harry	Debaufer Iii	Flintville	TN	37335	
Kathy	Tobey	Nashville	TN	37215	
Paula	Simmons	Cookeville	TN	38501	
Susan	Dean	Monteagle	TN	37356	
Buzz	Davies	Erwin	TN	37650	
Ben	Sweeton	Red Bank	TN	37415	
Carmen	Woods	Clarksville	TN	37043	
Stanford	Davis	Knoxville	TN	37914	
Rachel	Levine	Germantown	TN	38138	
Andrew	Johnson	Franklin	TN	37069	
Sarah	Park	Nolensville	TN	37135	
Catherine	Kalinowski	Hixson	TN	37343	
John	Kozub	Mount Juliet	TN	37122	
Andrea	Tatum	Martin	TN	38237	
Gene	Hughes	Johnson City	TN	37601	
Cheri	Rutherford	Oak Ridge	TN	37830	
Jennifer	Fuson	Rockford	TN	37853	
Keith	Croft	Nashville	TN	37214	
Caroline	Duley	Nashville	TN	37204	
Haylee	Schwerdt	Maryville	TN	37801	
Margaret	Franklin	Collierville	TN	38017	
Jason	Hartman	Clarksville	TN	37043	
Sarah	Raymer	Lenoir City	TN	37771	
John	Hammel	Pulaski	TN	38478	
Deb	Gochfeld	Oxford	MS	38655	
Debra	Dunson	Spring Hill	TN	37174	
Susan	Peeples	Pleasant Hill	TN	38578	
La	Armour	Nashville	TN	37205	
Adriana	Norris	Nashville	TN	37203	
William	Kornrich	Sneedville	TN	37869	
Ralph	Hubbard	Clinton	TN	37716	
Katy	Underwood	Strawberry Plains	TN	37871	
Steven	Lipson	Nashville	TN	37212	
Tiara-Lady	Wilson	Knoxville	TN	37918	
Cadee	Murray	La Vergne	TN	37086	
Scott	Banbury	Memphis	TN	38107	
Shirley	Bryant	Cordova	TN	38018	
Amy	M	Rogersville	TN	37857	
Frances	M	Rogersville	TN	37857	
Tina	Davis	Lebanon	TN	37087	

Connie	Arduini	Memphis	TN	38104	
Robert Dale	Sweeney	Columbia	TN	38401	
Amanda	Blount	Clarksville	TN	37043	
Reginald	Lowe	Clarksville	TN	37043	
Sarah	Schiller	Clarksville	TN	37040	
Karen	Reynolds	Clarksville	TN	37040	
Rob	Rich	Memphis	TN	38107	
Veronica	Cox	Greeneville	TN	37743	
Kent	Minault	Knoxville	TN	37917	
Charles	Phillips	Owensboro	KY	42301	
Steven Anthony	Jolly	Memphis	TN	38117	
Veronica	Cox	Greeneville	TN	37743	
Linda	Mathews	Kodak	TN	37764	
Sara	Oaks	Cordova	TN	38018	
Catherine	Swearengen	Memphis	TN	38111	
Gavin	Long	Knoxville	TN	37919	
Nancy	Mott	Knoxville	TN	37914	
Barbara	Allen	Knoxville	TN	37921	
Joe	Franklin	Knoxville	TN	37914	
Sue	DuBois	Walland	TN	37886	
Jon	Lindberg	Knoxville	TN	37922	
Alexander	Berta	Oak Ridge	TN	37830	
Janet	Michel	Knoxville	TN	37922	
Barbara	Snowberger	Concord	TN	37922	
Barbara	Nicodemus	Andersonville	TN	37705	
Keith	Kline	Knoxville	TN	37932	
Anne	Freres	Memphis	TN	38104	
John	Taylor Jr	Fayetteville	TN	37334	
Kathy	Chiavola	Nashville	TN	37209	
Tammy	Yarber	Kingsport	TN	37663	
Teresa	Ambrose	New Market	TN	37820	
Robert	Earls	Nashville	TN	37212	
Linda	Conard	Mountain City	TN	37683	
Kathryn	Smiley	Fall Branch	TN	37656	
Edward	Viscardi	Greeneville	TN	37745	
Rachael	Cantrell	Germantown	TN	38139	
Dale	Owens	Normandy	TN	37360	
Elizabeth	Gardner	Nashville	TN	37221	
Carolyn	Crabtree	Chattanooga	TN	37405	
Michael	Jackson	Morristown	TN	37814	
Robert	Benson	Lebanon	TN	37090	
Derrick	Allred	Chattanooga	TN	37411	
Julia	Jardine	Lebanon	TN	37090	
Patricia	Faulkner	Nashville	TN	37204	
Brady	Watson	Nashville	TN	37205	
Gregory	Arnold	Columbia	TN	38401	
Becky	Berenguer	Kingsport	TN	37664	
Selina	Webb	Kingston Springs	TN	37082	
Selina	Webb	Kingston Springs	TN	37082	

Glenn	Mellen	Signal Mountain	TN	37377	
Stacey	Schmitt	Clifton	TN	38425	
Lisa	Worley	Blountville	TN	37617	
James	Lynn	Cookeville	TN	38501	
Karen	Blanco	Harrison	TN	37341	
Grace	Stranch	Nashville	TN	37207	
Erika	Montijo	Franklin	TN	37064	
Erin	Burnap	Chattanooga	TN	37415	
Tyler	Ellison	Knoxville	TN	37912	
Cheryl	Phillips	Maryville	TN	37804	
Cheryll	Barker	Knoxville	TN	37923	
Shirley	Brown	Maryville	TN	37803	
Karen	Markum	Reliance	TN	37369	
Fran	Adler	Suwanee	GA	30024	
Andrew	Combs	Nashville	TN	37212	
Sarah	Talley	Hixson	TN	37343	
Lisa	Cravens	Crossville	TN	38572	
Abbey	Hooge	Woodburn	KY	42170	
Shanna	Moorman	Owensboro	KY	42301	
Ann	Barnes Adkins	Owensboro	KY	42303	
Linda	Sheridan	Chattanooga	TN	37409	
Cheryl	Cosby	Franklin	TN	37064	
Shawn	Zeringue-Krosnick	Cookeville	TN	38501	
Richard	Jones	Arlington	TN	38002	
Bo	Graham	Memphis	TN	38104	
Jessica	Claudio	Hixson	TN	37343	
Patricia	Davis	La Follette	TN	37766	
Tiffany	Henning	Owensboro	KY	42303	
Orin	Moe	Nolensville	TN	37135	
Ethan	Williams	Westmoreland	TN	37186	
Thomas	Wynm	Memphis	TN	38134	
Calvin	Burford	Oak Ridge	TN	37831	
Maggie	Pitt	Hermitage	TN	37076	
Mark	Blazer	Seymour	TN	37865	
Jamie	Brown	Knoxville	TN	37919	
Carol	Austein	Memphis	TN	38104	
Bryson	Hunter	Knoxville	TN	37917	
Bethanee	Burden	White House	TN	37188	
Logan	Hysen	Franklin	TN	37067	
Debbie	Williams	Manchester	TN	37355	
Rebecca	Wierschem	Knoxville	TN	37932	
Marion	Pavur	Loudon	TN	37774	
Lynn	Ellis	Knoxville	TN	37918	
Amber	Cook	Gainesville	GA	37377	
Marion	Coleman	Tullahoma	TN	37388	
Sheri	Derose	Gallatin	TN	37066	
Klemmer	Nicodemus	Hartford	KY	42347	
Christy	Hanna	Knoxville	TN	37931	
Will	Miller	Hampton	TN	37658	

Thomas	Williams	Bowling Green	KY	42103	
Gloria	Jones	Dickson	TN	37055	
Christine	Eardley	Hendersonville	TN	37075	
Lisa	Frazier	La Vergne	TN	37086	
Mari T.	Echevarria	Knoxville	TN	37909	
Arthur	Hazel	Owensboro	KY	42303	
Cynthia	Carlton	Hendersonville	TN	37075	
Edward	Chapman	Signal Mountain	TN	37377	
Gretalynn	Carpenter	Dunlap	TN	37327	
Elizabeth	Gassel	Knoxville	TN	37919	
Yvette	Rhoton	Memphis	TN	38104	
Alicon	Lee	Nashville	TN	37208	
Joy	Markham	GoodLet'sville	TN	37072	
Janie	Pearce	Hendersonville	TN	37075	
Benji	Strobel	Knoxville	TN	37919	
Mary Kay	Christophersen	Johnson City	TN	37601	
Michelle	Martinov	Kingsport	TN	37665	
Maria	Chapman	Ashland City	TN	37015	
Patrick	Fisher	Memphis	TN	38120	
Casey	Moses	Nashville	TN	37211	
Michelle	Harris	Oak Ridge	TN	37830	
Cliff	Cockerham	Nashville	TN	37209	
David	Lindsey	Beaver Dam	KY	42320	
Trudy	Wallack	Greeneville	TN	37743	
Robert Gary	Kelly	Fayetteville	TN	37334	
Valerie	Crawford	Nashville	TN	60625	
David	Rutledge	Crossville	TN	38555	
Margaret	King	Cunningham	TN	97321	
Charlotte	Brown	Memphis	TN	38119	
Nancy	Rolfes	Ooltewah	TN	37363	
Stephen	Reed	Kingston Springs	TN	37082	
Krystal	Love	Maryville	TN	37804	
Janice	Vanderhaar	Memphis	TN	38141	
TN - Bull Run / Paradise - 12/18 - ALL					
Confidential Information - Do Not Distribute					
Generated By: Zach Kopkin 12/19/2018 1:01 PM					
Sierra Club					

Humphreys-Rowe, Abbey

From: Ellen Smith [redacted]
Sent: Wednesday, December 19, 2018 3:45 PM
To: Pilakowski, Ashley Anne
Subject: Comment on Draft Potential Bull Run Fossil Plant Retirement Environmental Assessment: TVA Project 2018-35.

TVA External Message. Please use caution when opening.

Ashley Pilakowski
Tennessee Valley Authority
400 West Summit Hill Drive WT 11B
Knoxville, TN 37902
Via email

Dear Ms. Pilakowski:

Thank you for the opportunity to comment on the subject draft environmental assessment.

In reading the EA, I was surprised to find that the discussion of cumulative impacts of reasonably foreseeable future actions did not discuss the various possible actions that TVA could take after shutting down the facility, with the potential impacts of those actions. I recognize that DOE is not prepared to make these decisions, but a brief discussion of possible uses and their impacts would better inform the public and TVA's decisionmakers. It seemed to me that the discussion of cumulative impacts of reasonably foreseeable future actions fell short.

The site has substantial transmission connections that should be of value to TVA or industry. Could TVA consider using the site for some other type of electricity generation (gas turbine units? solar? wind? small modular nuclear reactors?)? Could it become an electricity storage installation to support the grid? Could it be cleared of buildings and waste, then sold for private industrial or commercial use?

Ellen Smith, [redacted]

Wade, Blair

From: Hal Stephens [redacted]
Sent: Friday, November 23, 2018 6:52 PM
To: Pilakowski, Ashley Anne
Subject: Bull Run best option

Follow Up Flag: Flag for follow up
Flag Status: Completed

I'll state a simple option that gas been there and obvious for a long time. Bull run has the wrong boiler for today's mission. The coal option needs to be maintained. Gas is too short sighted like making kids happy with candy. Best option is replace the boiler there with a Benson style boiler . Then bull run returns to being reliable capable and a fantastic hedge against the coming crunch of future gas market prices when global markets take gas over or environmental regs are applied to fracking.

Sent from my Verizon, Samsung Galaxy smartphone

KEN YAGER
SENATOR

12th SENATORIAL DISTRICT
CAMPBELL, FENTRESS, MORGAN, PICKETT,
RHEA, ROANE, AND SCOTT COUNTIES

[redacted]

Senate Chamber
State of Tennessee
NASHVILLE

CHAIRMAN OF COMMITTEES
STATE AND LOCAL GOVERNMENT
JOINT FISCAL REVIEW

MEMBER OF COMMITTEES
COMMERCE AND LABOR
ENERGY, AGRICULTURE, AND NATUAL RESOURCES

MEMBER OF TENNESSEE COMMISSION ON
AGING AND DISABILITY

December 12, 2018

Mr. William Johnson, CEO
Tennessee Valley Authority
400 W. Summit Hill Drive
Knoxville, TN 37902

Attention: Ms. Ashley Pilakowski
NEPA Compliance

Dear Mr. Johnson:

As a member of the Senate Energy, Agriculture and Natural Resources Committee of Tennessee, I would like to offer the following comments to the Tennessee Valley Authority in response to its call for comments on its recent Environmental Assessment of the Bull Run coal-fired generating plant.

TVA has stated that it intends to close two coal-fired power plants (Bull Run and Paradise) within the next five years, as described in detail in the Environmental Assessments. Earlier in its 2015 Integrated Resource Plan, TVA suggested that it is considering retiring; overall, around 2,600 MW of coal fired capacity in the relatively short term, including both Bull Run. In August, 2018, TVA announced a review of generating assets based on the future cost of maintenance and environmental compliance and other factors. TVA says it must continually evaluate its fleet to ensure flexibility and financial responsibility and has now prepared an environmental assessment (EA) for Bull Run to look at the site-specific impacts of the potential retirement. The assessments will be used to inform the TVA board early next year before a decision is made whether to retire either of the units.

This proposal comes at a time when President Donald Trump is seeking to ease carbon emissions standards for power plants to help revive the U.S. coal industry, which is vastly more dependable than renewable sources like wind and solar. On August 21, 2018, the U.S. Environmental Protection Agency (EPA) proposed the Affordable Clean Energy (ACE) rule which would establish emission guidelines for states to develop plans to address greenhouse gas emissions from existing coal-fired power plants. The ACE rule replaces the 2015 Clean Power Plan (CPP), which EPA has proposed to repeal because it exceeded EPA's authority. The CPP was stayed by the U.S. Supreme Court and has never gone into effect. Even TVA Board Member Kenneth Allen is hesitant to close down more coal plants. He has stated, "These assets [Bull Run and Paradise Fossil Plants] have served as part of TVA's generation backbone for

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MEMBER OF TENNESSEE COMMISSION ON AGING AND DISABILITY

decades. I believe the board will need a robust study to review areas such as resiliency and risk to help us make this decision."

Bull Run, first commercially operational in June, 1967, produces approximately 863 MW of capacity. Historically, Bull Run has provided base-load capacity to the electrical grid - providing stability; ongoing energy security through a steady electricity supply; and other important transmission system attributes. While Bull Run has a lower equivalent availability than in past years, additional maintenance and prudent operational practices could improve the unit operation so that the capacity continues to serve as a critical asset, available to provide exceptional reliable, base-load power necessary for the efficient operation of the electrical system.

The electric system grid is largely a legacy system that has evolved over many years. Central station generators are supported by high-voltage transmission systems. Economies of scale arise from larger generating units, and this legacy system includes a diverse fuel mix containing generation from coal, nuclear, natural gas, hydro, solar, wind, and other smaller resources.

Overall the system needs a reliable, flexible source of generation, especially as renewable power supply additions continue. The output of these renewable resources can change instantly, just as demand also changes in real time. No doubt central station generation has a critical role to play in robust system operations. In the *Polar Vortex* of January, 2014, for example, coal fired generating plants played a key role in ensuring the electrical system maintained system load in a stable manner. Coal generators continued to operate during this time while many other generators were unable to operate due to extreme temperatures and fuel shortages (NERC, *Polar Vortex Review*, September 2014).

TVA is set to continue its rigorous financial and operational evaluations and assessments in the decision to operate the Bull Run power plant. While these economic evaluations may suggest retirement within the next 5 years, several key reasons exist to maintain the operational status of the units for the foreseeable future:

a. *Fuel diversity is critical in times of extreme weather*, unavailability of natural gas or outages of other key resources due to a variety of uncertainties;
b. *Fuel security through the coal stockpile* ensures adequate supplies of fuel for substantial periods of time;
c. *Flexibility in operation*, even if the units are not as flexible as in prior years. *Flexibility is a key in operating the system in a robust, reliable and resilient manner*;
d. *Jobs and the economic implications of losing jobs* at the coal plant, as well as the loss of indirect-jobs due to the plant closures, are significant impacts. According to the

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Environmental Assessment, Bull Run employs 100 directly. While there are suggestions that power plant operators can easily be trained to work in other energy jobs such as solar installers, there are significant barriers to such 'transfer' of work skills. In addition, Bull Run contracts with coal and limestone mining operations and rail transportation supporting additional employment. Based on current consumption rates of 30,000 to 100,000 tons per year, the annual monetary value of limestone used at Bull Run ranges from approximately $371,400 to $1.2 million (USGS 2018). Likewise, Bull Run purchases an average of 500,000 short tons of coal per year from one low-sulfur surface mine in Indiana. While coal production and prices are generally declining locally and nationally, the coal consumption at Bull Run amounts to approximately 3 percent of the total coal produced annually from surface coal mines in Indiana. Coal consumed at Bull Run has an annual monetary value of about $21.4 million. The latest federal data show that the mining of this coal employs approximately 41 people (USEIA 2017).

While economic assessments may indicate a need to retire Bull Run coal plant, other considerations including the value of having the capacity available in times of dire need (e.g. Polar Vortex) should be considered as a way to maintain system reliability and resiliency. There are options available, as listed above, to increase the productivity and performance that should be utilized before shutting down the plant and leaving 123 men and women without employment. In summary, TVA should continue to operate the Bull Run unit for the foreseeable future for the reasons outlined in this letter. I respectfully submit these comments on behalf of the citizens I serve in the state of Tennessee.

Sincerely,

Ken Yager
Tennessee State Senator

KY:jg

Humphreys-Rowe, Abbey

From: Leo York [redacted]
Sent: Wednesday, November 21, 2018 5:42 PM
To: Pilakowski, Ashley Anne
Subject: Bull Run Steam Plant

TVA External Message. Please use caution when opening.

I have lived in the shadows of the Bull Fun Steam Plant since it's construction. I have suffered through decades of free flying Fly Ash. I have watched as hundreds of acres of land have been reduced to to landfills with toxic waste. I am very much in favor of shutting this plant down and cleaning this site up.

Resident since 1952.

Leo York
[redacted]

Last	First	Comment	Org/Agency	City	State	Zip	How Sent
Berry	Jeanette	1. Public hearing(s) should be held on shutting down Bull Run Fossil (BRF) power plant since this decision is strongly linked to public health and the environment as well as economics. 2. Implementing Alternative A – The No action Alternative would require 'construction of a 120-acre landfill . . . over the next six years." In addition to issues related to continued operation of BRF, this proposed expansion of CCR disposal on pristine land is unacceptable. 3. Table 2-2. states that beneficial impacts are minor for air quality and groundwater. Based on the explanation, it is not clear how TVA established the classification of 'minor'. Clarify whether these benefits are 'minor' on a county, regional or global level. 4. Use of once through cooling water is inefficient and an unwise use of natural resources. This inefficiency is another reason why BRF should be shut down. 5. With a capacity factor of 33% (compared with an expected 80% capacity factor), I agreed that continued operation of BRF is not supportable from a asset management perspective. 6. The draft EA states: "Because facility buildings, structures, and facilities would remain in place, there would be a long-term potential for direct discharges of chemicals, hazardous waste, and solid waste, including but not limited to friable asbestos releases, to receiving streams through sump discharges, storm water releases, and directly to adjacent surface waters." The proposal to allow the current structures to remain in place is not supported by the EA, which does not contain an analysis of closure options. An important aspect of the decision to shut down BRF is the closure plan. The draft EA proposes a minimal closure plan that would consist only of "monitoring, assessment, corrective action programs, or other actions deemed appropriate as specified in the EIP (i.e., Environmental Investigation Plan." Please examine the option to return the site to its original state or to replace the current structures with renewable power generation (e.g., solar panels) to eliminate the need for monitoring. 7. Since, "none of the physical infrastructure currently at the site would be removed," the science quality of highly utilized adjacent parks, Haw Ridge Park, Claxon Community Park, and Melton Lake Park would remain unchanged. TVA has not appropriately considered reuse of the property. It could either be returned to its original state or used as a site for solar energy. Either of these options would leave the site in a condition that better than proposed. TVA should evaluate remediating the site so that pollutions are not disposed in place and so the site will be safer (e.g., risks and liability associated with access to the site while it is not under surveillance), and more consistent with its surroundings (i.e., residential, recreational, wooded). 8. A literature search* indicates that "residues and waste produced by the combustion of the coal contain naturally occurring radionuclides such as 238U, 226Ra, 210Pb, 232Th and 40K." Other sources indicate that the 238U content in fly ash is so high that some countries considered reclaiming uranium from fly ash. However, sampling of the chemical composition of the Bull Run coal ash will not identify radionuclides other than Ra. From Table 4, Surface Stream Sampling and Analysis Plan Bull Run Fossil Plant (pg. 14) lists the constituents that are to be analyzed. Justify why TDEC and TVA do not plan to sample Bull Run CCR for 238U, 210Pb, 232Th or 40K. If justification cannot be made based on analytical data of the coal used for combustion over the time period of the collection of the CRR, add analysis for 238U, 210Pb, 232Th, 40K and other radionuclides that are in coal to the EIP. *Ref: https://www.ncbi.nlm.nih.gov/pubmed/28965987 9. Sample data from existing monitoring wells have not been made available to the public. These existing data help characterize the current extent of contamination and would highlight the importance of a comprehensive EIP. Make existing sample data from existing monitoring wells available to the public. 10. Consider installing a utility scale solar power system when the TVA's analysis of generation assets determines that BRF should be shut down. Consider re-training the 100 coal plant workers to work in the solar power system. As stated in the EA, replacement of capacity as needed by renewables or nuclear is preferable to natural gas.	Mrs.	Greenback	TN	37742	TVA Public Site
Burr	Gene	TVA should retire the Bull Run Fossil Fuel power generating facility, and replace it with a solar powered facility. The present plant is inefficient due to its age and is a major source of environmental pollution. The fact and reality of Climate Change demands that we accept responsibility for continued carbon emissions that increase the impact of the changes occurring in the atmosphere.	Scenic Tennessee	Knoxville	TN	37920	TVA Public Site
DE GRANDIS	GERARD	Please shut it down. This plant has done enough damage to the environment.		Estero	FL	33928-3262	TVA Public Site
Dean	William	Dear Committee: Please close the Bull Run Fossil Plant on Edgemoor Road at your earliest convenience. This facility uses antiquated coal combustion, and I think a city that hosts a National Lab should not be saddled with an unsightly and unhealthy power generation facility. Not only is Bull Run an eyesore and an insult to modern technology, and not only does it contribute to anthropogenic atmospheric chemistry change (and hence climate change) but I have dire concerns for the buried coal ash that is on site? Who will monitor this ash? For how long? What baseline data for surface water and groundwater has been collected? Will there be any effort to remove this buried ash? Will the towers be removed along with the structures? I am hoping TVA will remove all ash due to water intake for several communities, including Oak Ridge, Y12 and ORNL. Than you again for consideration to retire Bull Run. This is well over-due. Please ensure the safety and vitality of our communities and ecosystems and remove all structural components and waste trenches, too!	Citizen and oak ridge resident	Oak ridge	TN	37830	TVA Public Site
Dornan	Sam	As a resident of Tennessee who uses power generated by TVA, I firmly believe that TVA should retire the Bull Run coal plant as soon as possible. Limiting and controlling the impacts of climate change involves us reducing the amount of greenhouse gas emissions produced as soon as possible. Coal plants like Bull Run are among the worst emitters of these gases. In addition to closing the plant, TVA should replace any needed power with renewable energy such as solar and wind. Not only is renewable energy now cheaper than fossil fuels in the United States, it is also emission free.		Franklin	TN	37064-8348	TVA Public Site

Goss	Sandra	I write on behalf of Tennessee Citizens for Wilderness Planning, a 52 year-old environmental advocacy organization with a long and fruitful relationship with Tennessee Valley Authority. TCWP partners with TVA in stewarding the Worthington Cemetery Special Study Area in Oak Ridge, and works together on Kids in the Creeks programs. TCWP is based in Oak Ridge, near Bull Run Steam Plant. We advocate that TVA close the Bull Run plant.	Tennessee Citizens for Wilderness Planning.	Knoxville	TN	37919	TVA Public Site
Gunnell	Matt	Hi my name is Matt gunnell and I'm a resident of Clinton. I work as an airline pilot down st McGhee Tyson I drive by this plant every time I come and go to to work. In this day and age I believe there are smarter ways to create energy that have less effects on our air, water, and quality of life I've attached a photo I took flying over the general area. You can see what an eyesore the plant is even from 30,000 ft. You should try driving by it some time.	PSA Airlines, Inc.	Clinton	TN	37716	TVA Public Site
Joranko	Daniel	Tennessee Interfaith Power and Light strongly supports the proposed retirement of the Bull Run Fossil fuel plant by 2023. We believe that it is a moral imperative that the Tennessee Valley Authority continue to move towards lower-carbon production. The retirement of Bull Run would be an important step in this direction. Moreover, fossil plants also have higher negative health impacts than cleaner fuel alternatives. Finally, we believe that there are more economical alternatives to this older fossil fuel plant. We thank you for this opportunity to comment.	Tennessee Interfaith Power and Light	Knoxville	TN	37912	TVA Public Site
Kennedy	Robert	The transmission infrastructure that is part of the Bull Run plant should not have to be retired also. It is a tremendous asset that could enable the best beneficial industrial re-use of Bull Run's ~1-square-mile footprint. Electricity-hungry industries such as data centers would be perfect on that site. • Nowadays, managing the variable supply and demand of electricity has become more important than mere generating capacity. Therefore grid-scale electricity storage to supplement TVA's storage assets like Raccoon Mountain, would be a highly appropriate beneficial re-use of the site. Why? The big energy news this year is that fixed flat-panel photovoltaic technology has crossed below the $1-per-watt-all-in threshold, about 1.5 years ahead of the forecast I made back in 2010. Large grid-scale systems were quoted last summer in the $1.00 to $1.10 range; some were even "sub-dollar"! One correspondent of mine recently bid a job for 3.14 cents per kWh (i.e., $31.40 per MWh); his company *lost* to somebody else @ 2.8 cents per kWh ($28 per MWh, which corresponded to an overall construction cost of just 84 cents per watt). That is literally half of what was breakeven just 3 years ago (~$30 per MWh now vs. ~$60 per MWh then). EPCs whom I have spoken with expect overall system costs to fall another nickel to 7 cents by early 2019, notwithstanding tariffs. This is real-time intel from practitioners making a living (barely) at building this stuff. Recall also the astounding collapse in prices for LED lighting technology, by a factor of 10 in just a few years, again beating the "experts". Hand-in-hand with this phenomenon is that now utilities are not interested in pure wind and/or solar solutions, or mere generating capacity anymore. Today, any proposal by an independent power producer (IPP) to a utility better have a storage component. In those places where the wind and/or solar resource exists, "storage" means "modern grid-scale batteries" not "pumped hydro storage". As a result, the cost of grid-scale batteries has begun to fall sharply, as battery production is ramped up to meet the new demand, and economies of scale in battery manufacturing happen. I am amazed at how cost-effective grid-scale storage is becoming, and how fast. Traditional lead-acid batteries such as those in motor vehicles are not used in grid-scale storage anymore due to weight, high cost, high maintenance, short life, and the hydrogen gas emission hazard. The battery-storage market is now dominated (95% of deployed systems) by sealed, lightweight, low-maintenance lithium-ion technology; however, redox-flow and zinc-hybrid ion batteries are growing rapidly. The cost of grid-scale storage is predicted by industry observers to fall to US$1.40 per watt by 2021, which suggests that the cost curve for grid-scaled storage is lagging the steep decline in photovoltaic technology by about 5 years. Therefore, I expect to see US$1-per-watt for grid-scale storage by 2025. Note that US$1 per watt is the approximate cost of single-cycle gas turbine or a diesel-fired generator right now, a machine that requires maintenance, and that consumes fuel must which not free. Modern battery storage requires little maintenance and no fuel. This storage revolution in turn is having "knock on" effects. I suggest that this trend will only get stronger as time goes on, and battery storage will eventually supplant generators for modest loads.	Environmental Quality Advisory Board, Oak Ridge	Oak Ridge	TN	37830	TVA Public Site
Lichtenwalter	Jerry	Coal is more expensive than natural gas and renewables. All utilities around the US know this and are closing coal plants. To keep these open is poor management and costly to the rate payers. In addition they are unhealthy to the public. TVA needs to close both plants as soon as possible.		Knoxville	TN	37922	TVA Public Site
Logan	Joanne	I was very pleasantly surprised by TVA's consideration of decommissioning the Bull Run Fossil Plant by 2023. I wholeheartedly support the closing, and wish it could take place sooner than 2023. I also hope that TVA will be responsible for the cleanup of the property if in fact, it is not going o be repurposed as a natural glas plant. This would include proper closure and disposal of all coal ash containment areas. I realize that the relatively low cost of natural gas is the main driver for this decision, but TVA should also increase the portfolio proportion of renewable energy such as wind or solar to compensate for the power reductions incurred by the closing of BRF. Thee are so many benefits that will be realized by the removal of this coal fired plant, and I cannot think of a single negative factor that needs to be considered. Please move forward as rapidly as possible.		Knoxville	TN	37909	TVA Public Site
McElrath	Sadie	My name is Sadie McElrath and I live in Chattanooga, TN. I am in support of closing the Bull RUn Fossil plant. I feel the section of the report discussing the positive impact on air quality if the plant were to close was understated. I am a pediatric nurse practitioner and see first-hand the effects of asthma on the quality of life for my patients. According to the Fourth National Climate Assessment release on 11/23/18, increasing rates of asthma and environmental allergies will continue to occur if we continue to use fossil fuels for energy. I would like to see TVA create jobs in the renewable energy sector, not in the fossil fuel sector. I would also like the report on the environmental impacts of the plant to state more strongly the impact the plant is currently having on air quality.	Self	Chattanooga	TN	37411	TVA Public Site
McIntosh	JoAnn	I appreciate your forward-thinking in considering the closures of the Bull Run and Paradise coal plants. Since your analyses shows that these two plants aren't necessary in meeting energy demands, and that the plants are in fact costly and inefficient to run and maintain, it follows that the closure of these plants would be in the best economic (as well as environmental) interest of TVA and its customers. It is my hope that, in addition to closing the plants, TVA is developing a plan for transitioning those sites to cleaner, more energy-efficient technologies that have a greater potential for economic growth and job creation in the surrounding communities. Again, thank you.		Clarksville	TN	37043	TVA Public Site

Olsen	Catherine	Hi would like to be heard as being supportive of the retirement of Bill Run a fossil Plant. I would love to see TVA invest and support clean energy production such as hydroelectric, wind and solar energy production. The time is now for us to begin to transition away from carbon producing methods of energy production, as well as limit the use of nuclear fuel because of the risk and environmental impact of nuclear materials.		Knoxville	TN	37922	TVA Public Site
Ozegovich	Joe	Please lead us away from coal and to clean renewable energy sources like wind and solar. Need bold change in generation standards, less centraliization, more community solar and micro grids.		Bartlett	TN	38135	TVA Public Site
Parrish	Ryan	I am very concerned about the Bull Run Fossil Plant. As a resident of the area I can see the stacks from my front porch. While they are very unsightly, the facility provides much needed energy to the area and I can see where trade offs are good for the people overall. After reading the Environmental Assessment and seeing there were no plans to dismantle the plant after retirement, I was APPALLED! Having an abandoned and decaying Fossil plant with tons of waste on the site will definitely hurt the area, and as time goes on the damage will increase.Having an abandoned and decaying plant will definitely decrease property values and b detrimental to any outdoor functions (such as the community park adjacent to the plant). I feel that the facility and waste products should be dismantled and disposed of and the land be made available for some productive purpose after retirement. Many Claxton citizens already have a 'bad taste in their mouth' from when TVA forced them from their homes (many living on their property and homes for over 5 decades) to build ash storage facilities. While I understand BRF is out of date with more modern facilities and the reasons for wanting to retire it, TVA should do what is right for the residents and the community. I have no opinion whether the plant should go or stay, I do have a very strong belief that the plant should be dismantled, waste materials removed, and the land left in a condition to help the community, not hurt it. Leaving the plant abandoned and decaying is completely irresponsible	Resident	Clinton	TN	37716	TVA Public Site
Ringe	Axel	On behalf of the 140,000 members and supporters of the Sierra Club in Tennessee, I appreciate the opportunity to provide comments on the proposed closure of Bull Run Fossil Plant in Anderson County. The Sierra Club fully supports alternative B– Potential Retirement of Bull Run Fossil Plant. As is pointed out in the Environmental Assessment, the plant is old, is in need of significant capital expenditures to address material challenges, is not needed to maintain TVA's electrical output, and would require upgrades to comply with the EPA's effluent limitation guidelines. Furthermore, closing the plant would eliminate the emission of a number of pollutants and well as greenhouse gases. For both economic and environmental reasons, the closure of the plant makes eminent sense. Thank you for your consideration of these comments. Axel C. Ringe Conservation Chair Tennessee Chapter Sierra Club onyxfarm@bellsouth.net	Tennessee Chapter Sierra Club	New Market	TN	37820	TVA Public Site
Waterman	John Todd	Comments on POTENTIAL BULL RUN FOSSIL PLANT RETIREMENT ENVIRONMENTAL ASSESSMENT by John Todd Waterman, 418 Orchard knob Road, Clinton, TN 37716 Submitted Online December 19, 2018 With its frequent, unpredictable, and costly outages and its limited flexibility, Bull Run Fossil Plant has clearly reached the end of its life as a reliable, cost-effective component of the TVA fleet. Shutting down Bull Run would be prescient also for a better reason: there will be strong pressure in the near future to steeply curtail CO2, and coal produces much more CO2 per kW than either oil or gas, about 3 million tons a year even operating only ? of the time. The Trump Administration’s coal-friendly climate policies are unlikely to continue. Those policies make the U.S. is a solitary outlier among nations. On October 8, 2018, the Intergovernmental Panel on Climate Change (IPCC) issued its sternest warning yet, saying we now have only 10-12 years to radically reduce CO2 if we’re to avoid climate crisis by 2040.* On May 23, 2018, a thorough economic analysis in the journal Nature** concluded, “Relative to a world that did not warm beyond 2000–2010 levels, we project 15%–25% reductions in [GDP] per capita output by 2100 for the 2.5–3?°C of global warming implied by current national commitments, and reductions of more than 30% for 4?°C warming,” and found a cost-benefit for climate mitigation of almost 1-70.*** The political climate is changing, too: as superstorms, wildfires, floods, droughts, and sea-level rise make climate change intuitively obvious, a rapidly-increasing majority of the public acknowledge its dangers. Replacing any needed capacity with wind or solar generation would be economically and environmentally preferable to replacing it with natural gas generation. First, increasing pressure to reduce CO2 would make it likely that a costly gas plant would soon need to be replaced with a costly renewable facility. Since solar and wind are already cost-competitive and rapidly declining, transitioning directly to either or both would likely be less costly. Second, by adding mechanical storage - flywheels or air- or water-pressure - renewables’ short-term variability would be eliminated, making them more reliable than any fossil source over time, since wind and sun are relatively more stable and predictable. Third, renewables are not vulnerable to unpredictable and costly fuel price increases - they’re free. Fourth, renewables are not vulnerable to unpredictable and costly environmental regulation or carbon-pricing laws - they’re relatively harmless. I, therefore, support TVA’s conclusion that Bull Run should be shut down. And I urge that any needed capacity be replaced directly with renewable sources. I also urge that Bull Run be demolished rather than left in place, and that its coal ash be cleaned up and moved far away from Melton Lake, where it threatens water quality. I also urge that TVA transition		Clinton	TN	37716	TVA Public Site

Waterman	John Todd	Citation Links for: Comments on POTENTIAL BULL RUN FOSSIL PLANT RETIREMENT ENVIRONMENTAL ASSESSMENT by John Todd Waterman, 418 Orchard knob Road, Clinton, TN 37716 Submitted Online December 19, 2018 These links did not migrate to this form. My apologies: * Major Climate Report Describes a Strong Risk of Crisis as Early as 2040 (New York Times): https://www.nytimes.com/2018/10/07/climate/ipcc-climate-report-2040.html ** Nature Study: https://www.nature.com/articles/d41586-018-05219-5 ***Guardian Article: https://www.theguardian.com/environment/climate-consensus-97-per-cent/2018/may/29/trump-administration-refuses-to-consider-that-97-of-climate-scientists-could-be-right		Clinton	TN	37716	TVA Public Site
WIEST	mick	The Bull Run Steam Plant needs to convert to a clean fuel like natural gas, and get away from the pollution and waste concerns it has now with burning coal. I am not in favor of expanding their land base around the plant to deposit coal waste, threatening the community with more pollutants, and impacting the historic David Hall Cabin.		OAK RIDGE	TN	37830	TVA Public Site