Document Type: Supplemental EA-Administrative Record
Index Field: Supplemental EA
Project Name: Bull Run Fossil Plant Ash Impoundment Closure Project
Project Number: 2015-31

BULL RUN FOSSIL PLANT
ASH IMPOUNDMENT CLOSURE PROJECT
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
Anderson County, Tennessee

Prepared by:
TENNESSEE VALLEY AUTHORITY
Chattanooga, TN

July 2019

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Symbols, Acronyms, and Abbreviations

BRF	Bull Run Fossil Plant
CAA	Clean Air Act
CCR	Coal Combustion Residuals
CWA	Clean Water Act
EIP	Environmental Investigation Plan
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GWPS	Ground Water Protection Standard
MGD	Million Gallons Per Day
mg/L	Milligrams Per Liter
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
PEIS	Programmatic Environmental Impact Statement
PWB	Process Water Basin
SEA	Supplemental Environmental Assessment
TDEC	Tennessee Department of Environment & Conservation
TVA	Tennessee Valley Authority
ug/L	Micrograms Per Liter

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CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Introduction and Background

The Bull Run Fossil Plant (BRF) is in Anderson County, Tennessee, about 5 miles east of downtown Oak Ridge, TN and 13 miles west of Knoxville, TN (Figure 1-1). BRF is operated by Tennessee Valley Authority (TVA) and is located on a 750-acre reservation on the east side of Melton Hill Reservoir at Clinch River Mile 48. Most nearby lands are United States Department of Energy reservation properties for the Oak Ridge National Laboratory facilities, but there are also residential and recreational land uses in the vicinity.

The BRF plant was built between 1962 and 1966. Commercial operation began in June 1967. Nameplate generating capacity for the single unit is 950 megawatts; BRF is the only single-generator coal-fired power plant in the TVA system. 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.

View of Main Ash Impoundment (Right) and Stilling Pond (Left) along Separator Berm

The coal combustion residuals (CCR) generated by the plant include fly ash, bottom ash, and flue gas desulfurization gypsum. Disposal areas for CCR include a dry fly ash stack located east of the plant and a system of wet CCR disposal areas located south of the plant, ending at the convergence of Bullrun Creek and the Clinch River.

Programmatic Environmental Impact Statement – June 2016

TVA ceased sluicing CCR material at BRF in 2015 and began to address closure of the CCR facilities at the plant. As originally proposed in a June 2016 Ash Impoundment Closure Programmatic Environmental Impact Statement (PEIS) (TVA 2016), (Record of Decision issued on August 5, 2016), the approximately 33-acre Main[1] Ash Impoundment and Sluice Channel would be Closed-in-Place, which would entail dewatering, grading and covering with an approved cover system. Under the originally proposed action, non-CCR process water from the plant and storm water continued to be discharged into the system, and ultimately into the Stilling Pond. However, process wastewater flow would be conveyed to the Stilling Pond through a new lined ditch prior to release at Outfall 001.

[1] In previous documents this area was referred to as the “Fly Ash Impoundment”. Going forward in this SEA, TVA will now refer to this area as the “Main Ash Impoundment” to conform to other reports; however, the extent and description of this area have not changed.

Figure 1-1. BRF Project Location

Supplemental Environmental Assessment – October 2017

Subsequent to the completion of the 2016 PEIS, TVA determined that there is a long-term need for wastewater treatment at BRF and revised the closure plan to support a wastewater treatment system at BRF. To support the revised closure plan, TVA issued a Supplemental Environmental Assessment (SEA) in 2017 (TVA 2017a) (Finding of No Significant Impact issued on October 23, 2017) which revised the selected alternative to closure of the Main Ash Impoundment and Stilling Pond in place using an approved cover system. In addition, the Stilling Pond and a portion of the Main Ash Impoundment would be repurposed for use as process water basins (PWB). The capping system for the Closure-in-Place would serve as a bottom liner for the PWBs. The system would handle only storm water flow and non-CCR process water flow from the plant.

Supplemental Environmental Assessment – Draft Released August 2018

TVA revised the closure plan evaluated in October 2017 by issuing a second SEA in 2018 (Draft SEA issued August 23, 2018). Under the revised plan, an approximately 20-acre portion of the Main Ash Impoundment, containing approximately 2,900,000 yd^3 of CCR materials would be Closed-in-Place. The remaining portion (approximately 13 acres) of the

Main Ash Impoundment would be Closed-by-Removal with up to an estimated 595,000 yd^3 of CCR materials being removed and transported to an onsite landfill. The portion of the Main Ash Impoundment that would be Closed-by-Removal would then be repurposed into a PWB (subsequently designated as PWB2). In addition, the Stilling Pond would be Closed-by-Removal, which would entail removal and transport of up to an estimated 71,000 yd^3 of CCR and residual materials to an existing onsite landfill. The Stilling Pond would also be repurposed as a PWB (subsequently designated PWB1).

Supplemental Environmental Assessment – Draft Re-Released April 2019

Subsequent to the issuance of the August 2018 Draft SEA, TVA has gained additional insight on conditions of the Main Ash Impoundment and Stilling Pond at BRF. TVA has encountered worker safety and stability issues related to characteristics of the stored CCR. As a result, TVA recommends changes for construction of PWB2 (the PWB in the area of the Main Ash Impoundment). The new proposed plan will make the construction effort safer and more feasible. It includes a proposed interim action to leave the CCR in the Main Ash Impoundment in place and construct an interim PWB2 on top of the existing CCR impoundment. This interim solution would be implemented until a decision on a permanent solution for the disposition of the underlying CCR is made.

TVA's insight on conditions of CCR in the Main Ash Impoundment and Stilling Pond is related to the specific characteristics of CCR material. The material in these areas originates from argillaceous coal (i.e., coal containing silt to clay-sized particles) which results in fine-grained CCR material. This characteristic leads to CCR that takes longer for pore water to drain as compared to CCR that is characterized as having higher coarse-grain content. Tests from several samples in the Stilling Pond confirm that the CCR has high percentages of fine-grained material. These conditions make it difficult to dry the ash to a degree necessary for excavation and placement in a lined landfill.

During early excavation activities associated with closure of the Stilling Pond and construction of PWB1, working with this wet, fine-grained CCR became a safety concern, due to the material's loss of strength when saturated, and subsequent detrimental effect on local stability during the removal process. Excavation of the CCR under these conditions is difficult and time-consuming, which can cause construction schedule delays, increasing worker exposure to unsafe conditions. Specialty amphibious equipment with lower than expected production rates is necessary to ensure operator safety.

The Main Ash Impoundment and Stilling Pond are adjacent to one another and likely have similar characteristics. As PWB2 would require excavation of approximately 10 times the amount of material as PWB1, the effects of the fine-grained CCR would be compounded and made more complex. As with PWB1, the soft fine-grained nature of this material would require specialized, less efficient, amphibious equipment and dewatering methods to prevent local stability issues from posing a safety risk for construction personnel. There is also a smaller footprint available for material from PBW2 to be handled and dried which adds to the complexity of the work (e.g., extended drying durations).

The new proposed PWB system (PWB1 coupled with PWB2) is designed to work in series. The conveyance channel would discharge to PWB2, which would drain to PWB1 where water is discharged through an NPDES permitted outfall (Outfall 001). PWB1 does not have the capacity to manage storm water and non-CCR process water as a single system. During the period of construction proposed under either the Closure-by-Removal or

Closure-in-Place Alternatives, TVA is at risk for exceeding NPDES permit limits during storm events or exceeding the basin's capacity. Because of the measures necessary to safely work with the material in the Main Ash Impoundment, the construction timeline would be significantly extended, which in turn extends the period during which TVA would be at risk for exceeding NPDES permit limits.

Therefore, given the issues associated with constructability/timing/safety and environmental compliance, as explained above TVA added an additional alternative for closure of the Main Ash Impoundment at BRF. Specifically, TVA is considering closing the Main Ash Impoundment in place using an approved interim cover system and repurposing a portion of the closed area for use as interim PWB2. TVA estimates Closure-in-Place of the Main Ash Impoundment and repurposing a portion of the impoundment as interim PWB2 would take approximately 10 months.

All of the proposed designs are technically sound and protective of the environment. TVA recognizes that in addition to state and federal water and waste regulations, TVA's CCR disposal areas at BRF, including the impoundments, are subject to a TDEC Commissioner's Order (Commissioner's Order OGC15-0177) . In Section VII.D.1 of the TDEC Commissioner's Order, TDEC recognizes that TVA may, in compliance with CCR Rule requirements, elect to close CCR surface impoundments and/or landfills before completion of the investigative process outlined in the Order. While TVA may be forced to complete construction by deadlines established by the CCR Rule, TVA remains dedicated to completing the site-wide investigation, the comprehensive environmental assessment, and any corrective actions that are identified as necessary. TVA also acknowledges that any actions taken before the TDEC Commissioner's Order process is complete are subject to the potential for TDEC to subsequently require TVA to take other and/or further remedial actions as a result of the investigative process. Accordingly, PWB2 is described herein as "Interim" because TVA acknowledges that additional or different actions may be required under the Order with respect to the CCR that remains underneath Interim PWB2, and in that event, TVA could be required to remove Interim PWB2 in order to take the necessary actions.

The purpose of this document is to present a supplement to the PEIS, Part II Site-Specific NEPA Review: Bull Run Fossil Plant and the previous October 2017 Bull Run Fossil Plant Ash Impoundment Closure Project Supplemental Environmental Assessment (TVA 2016, TVA 2017a). This new SEA has been prepared to account for changes to the closure plan for the Main Ash Impoundment and Stilling Pond identified in the NEPA review and in the previous SEA. In addition, this SEA includes an analysis of a new alternative for closure of the Main Ash Impoundment and Stilling Pond that was developed upon review of results of further studies of the composition of materials in the Main Ash Impoundment. This alternative was not evaluated in the 2018 Draft SEA.

1.2 Decision to be Made

TVA must decide how to develop PWBs at BRF to support wastewater treatment at the plant. TVA's decision considers factors such as potential environmental impacts, economic issues, worker health and safety, availability of resources and TVA's long-term goals.

1.3 Purpose and Need

The purpose of the proposed action is to support the implementation of TVA's stated goal to transition from wet to dry storage of CCR at its coal plants by closing the Main Ash

Impoundment and Stilling Pond at BRF, and to assist TVA in complying with state and federal requirements such as the National Pollutant Discharge Elimination System (NPDES) permit, and the U.S. Environmental Protection Agency's (EPA) CCR Rule. This project would support a long-term need for wastewater treatment at BRF by providing a facility for processing non-CCR wastewater in the near-term and storm water in the long-term.

1.4 Other Environmental Reviews and Documentation

The following environmental reviews are relevant to the proposed action:

Final Ash Impoundment Closure Environmental Impact Statement (TVA 2016). The EIS was prepared to address the closure of CCR impoundments at all of TVA's coal-fired power plants. The report consists of two parts: Part I – Programmatic NEPA Review and Part II – Site-Specific NEPA Review. In Part I, TVA programmatically considered environmental effects of closure of ash impoundments using two primary closure methods: (1) Closure-in-Place and (2) Closure-by-Removal. A Record of Decision was released in July 2016 that would allow future environmental reviews of CCR impoundment closures to tier from the PEIS. In Part II, TVA considered site-specific ash impoundment closure activities at each of six fossil plants, including BRF. The preferred alternative at BRF was determined to be Closure-in-Place. This SEA is intended to tier from the PEIS (TVA 2016) and revise the October 2017 SEA (TVA 2017a) to evaluate the revised closure plan for the existing ash impoundments at BRF.

Bull Run Fossil Plant Ash Impoundment Closure Project Supplemental Environmental Assessment (TVA 2017a). This supplemental EA revised the selected alternative to the closure of the Main Ash Impoundment and Stilling Pond in place using an approved cover system and repurposing a portion of the closed area for use as a PWB. The capping system for the Closure-in-Place would serve as a bottom liner for the PWB. The proposed PWB would handle only storm water flow and non-CCR process water flow from the plant.

Potential Bull Run Fossil Plant Retirement Environmental Assessment (TVA 2019). In August 2015, TVA published the 2015 Integrated Resource Plan (IRP; TVA 2015b) and associated environmental impact statement (EIS) (TVA 2015a) which was developed with input from stakeholder groups and the general public. The 2015 IRP identified a range of potential resource additions and retirements throughout the TVA power service area. Since that time, TVA has experienced flat to declining demand and has conducted economic analyses of all its generating assets considering load outlook, economic benefits and costs, performance, and environmental and social impacts. 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. The EA was prepared to assess impacts of the potential retirement of BRF.

The findings in these documents related to this SEA are incorporated in Chapter 3 for each relevant environmental resource, as appropriate.

1.5 Permits, Licenses and Approvals

TVA had previously identified some permits and approvals required to support the closure of the Sluice Channel and Main Ash Impoundment at BRF. Authorizations required for the proposed action could include the following:

- National Pollutant Discharge Elimination Permit (NPDES) Construction Storm Water Permit for storm water runoff from construction activities.
- BRF's Storm Water Pollution Prevention Plan would be revised to include both the temporarily covered portions of the Main Ash Impoundment, the closed Stilling Pond, and the new PWBs.

1.6 Scope of the Supplemental Environmental Assessment

The geographic scope of this supplemental analysis includes the 41.6-acre area that contains the Main Ash Impoundment and the Stilling Pond (see Figure 1-1). All activities associated with the proposed action would be limited to previously disturbed areas. Alternatives B and C would entail regrading and consolidating existing CCR materials and would require less offsite borrow than was predicted in the PEIS Part II analysis. This SEA addresses the potential impacts of the development and operation of the actions associated with the proposed alternatives.

TVA prepared this SEA to comply with NEPA and regulations promulgated by the Council on Environmental Quality and TVA's procedures for implementing NEPA. This assessment tiers off the impact analysis in the PEIS (TVA 2016) and the previous SEA (TVA 2017a) and evaluates existing conditions for the proposed alternative actions that are based upon the previous SEA and FONSI (2017a).

Based on the specific activities proposed for this project, TVA focused its environmental review on specific resources and eliminated others from further evaluation. This SEA does not contain detailed discussions of resources not found in the project area or where site-specific conditions would not change the impact analysis presented in the PEIS and the site-specific analysis contained in Part II of the PEIS (TVA 2016) or previous SEA (2017a).

In consideration of the nature and scope of the proposed action, TVA determined that the potential impacts of the alternatives under consideration on the following environmental resources are bounded by the prior PEIS and SEA including the site-specific assessment of the closure and or repurposing of the Sluice Trench, Main Ash Impoundment and Stilling Pond at BRF:

- air quality
- climate change
- land use
- prime farmland
- vegetation
- wildlife
- aquatic ecology
- threatened and endangered species
- parks
- public recreation
- cultural and historic resources
- visual resources
- hazardous materials and hazardous waste
- solid waste
- noise
- transportation

- geology
- wetlands
- floodplains
- natural areas
- socioeconomics
- environmental justice
- public health and safety

Because the proposed action is primarily associated with the closure, consolidation, and reconfiguration of the Main Ash Impoundment and Stilling Pond, the only resources not bounded by the previous site-specific analyses and therefore retained for detailed analysis in this SEA are groundwater and surface water. Although Alternatives B and C include Closure-by-Removal of the Stilling Pond, and Alternative B includes Closure-by-Removal of a portion of the Main Ash Impoundment, any potential impacts on noise, air quality, or climate change (i.e., greenhouse gas emissions) related to the transport and storage of CCR to an onsite BRF landfill are anticipated to be negligible as the transport of CCR is short-term and limited to onsite vehicle movements. In addition, the volume of offsite borrow is substantially reduced from that considered in the previous site-specific analysis in Part II of the PEIS (TVA 2016). Therefore, potential effects on air quality, noise, climate change and transportation are not assessed in this SEA.

TVA's action under this SEA would satisfy the requirements of Executive Order (EO) 11988 (Floodplains Management), EO 11990 (Protection of Wetlands), EO 12898 (Environmental Justice), EO 13112 as amended by EO 13751 (Invasive Species), and applicable laws including the National Historic Preservation Act, Endangered Species Act (ESA), Clean Water Act (CWA), and Clean Air Act (CAA).

1.7 Public and Agency Involvement

The 2018 Draft SEA was posted on TVA's Web site for a 20-day public review period on August 23, 2018. The availability of the draft SEA was announced in local publications. TVA notified local, state, and federal agencies and federally recognized tribes of its availability through their required consultations.

TVA received comments on the 2018 Draft SEA from the Tennessee Department of Environment and Conservation (TDEC), the Sierra Club, EPA, and two members of the public. TVA considered the substantive comments it received on the Draft SEA and edited the revised Draft SEA as appropriate. Subsequent to the public review period for the Draft SEA, TVA received results of additional studies of the composition of the materials in the Stilling Pond and Main Ash Impoundment that initiated the development of a new alternative for consideration in this SEA. Therefore, TVA posted a revised Draft SEA for a 20-day public review period on April 22, 2019. The availability of the revised Draft SEA was announced in local publications. TVA notified local, state, and federal agencies and federally recognized tribes of its availability through their required consultations.

TVA received comments on the revised Draft SEA from TDEC, EPA, the Anderson County Board of Commissioners, and one member of the public. The Sierra Club submitted a petition that was signed by 96 individuals, 36 of which added a personal comment. In addition, the Southern Environmental Law Center and five other environmental advocacy groups submitted a 10-page letter with hundreds of pages of attachments. The other groups were: Appalachian Voices, Southern Alliance for Clean Energy, Statewide Organizing for Community eMpowerment, Tennessee Chapter of the Sierra Club, and Tennessee Citizens for Wilderness Planning (collectively referred to as Conservation Groups). Appendix A contains the comments on the Draft EA and TVA's responses to those comments.

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CHAPTER 2 – ALTERNATIVES

2.1 Description of Alternatives

Alternatives evaluated in detail for this SEA are described below.

2.1.1 Alternative A – The No Action Alternative

Under the No Action Alternative TVA would close the Stilling Pond and Main Ash Impoundment in place as previously described in the October 2017 SEA (TVA 2017a). The Stilling Pond and a portion of the Main Ash Impoundment would be repurposed as process water basins (PWB) as previously described in the October 2017 SEA.

2.1.2 Alternative B – Closure-in-Place of a Portion of the Main Ash Impoundment, Closure-by-Removal of the Remaining Portion of the Main Ash Impoundment and Repurposing into a Process Water Basin (PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway

Under this alternative, TVA proposes to cover, with an approved cover system, an approximately 20-acre portion of the Main Ash Impoundment containing approximately 2,900,000 yd^3 of CCR materials. The remaining portion (13 acres) of the Main Ash Impoundment would be Closed-by-Removal with up to an estimated 595,000 yd^3 of CCR materials being removed and transported to an onsite landfill. The portion of the Main Ash Impoundment that is Closed-by-Removal would be repurposed into a process water basin (PWB2) for BRF (Figure 2-1).

In addition, the Stilling Pond would be Closed-by-Removal, which would entail removal and transport of up to an estimated 71,000 yd^3 of CCR and residual materials to an existing onsite landfill. The Stilling Pond would be repurposed as a process water basin (PWB1). A subsurface drainage layer would be installed to be used during construction of PWB1 to handle any water that enters the excavation during the liner placement. Following construction of the subsurface drainage system, the liner for the proposed new PWB1 would be installed. The drainage system is not expected to be needed once construction is completed.

Generalized construction steps for this project include dewatering the Stilling Pond and Main Ash Impoundment and removal of CCR materials from the Stilling Pond and the Closed-by-Removal portion of the Main Ash Impoundment. Handling of wet material would occur inside the footprint of the current Main Ash Impoundment and Stilling Pond. The material would be handled and dried, and once dry, it would be disposed of in the onsite landfill.

During dewatering and construction of PWB2, pore water would be removed from the Main Ash Impoundment, pumped into temporary treatment tanks or boxes, where it would be treated, and discharged through the NPDES permitted Outfall 001. Free water would be pumped and discharged through Outfall 001. Mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. These measures could include but would not be limited to implementing BMPs,

wastewater treatment technologies, and/or rerouting or recycling water. Once constructed, the PWBs would only manage storm water and non-CCR wastewater from BRF facilities.

For the covered portion of the Main Ash Impoundment, if the CCR materials are suitable for regrading and consolidation, they would remain in the impoundment. If they are not suitable for regrading, the material would be removed, dried, and placed in an onsite landfill. In areas where CCR materials are removed and placed in the onsite landfill, suitable fill material may be imported to grade and support the cover system. The cover system in the Main Ash Impoundment would be constructed to the same standards as described in Part II of the PEIS.

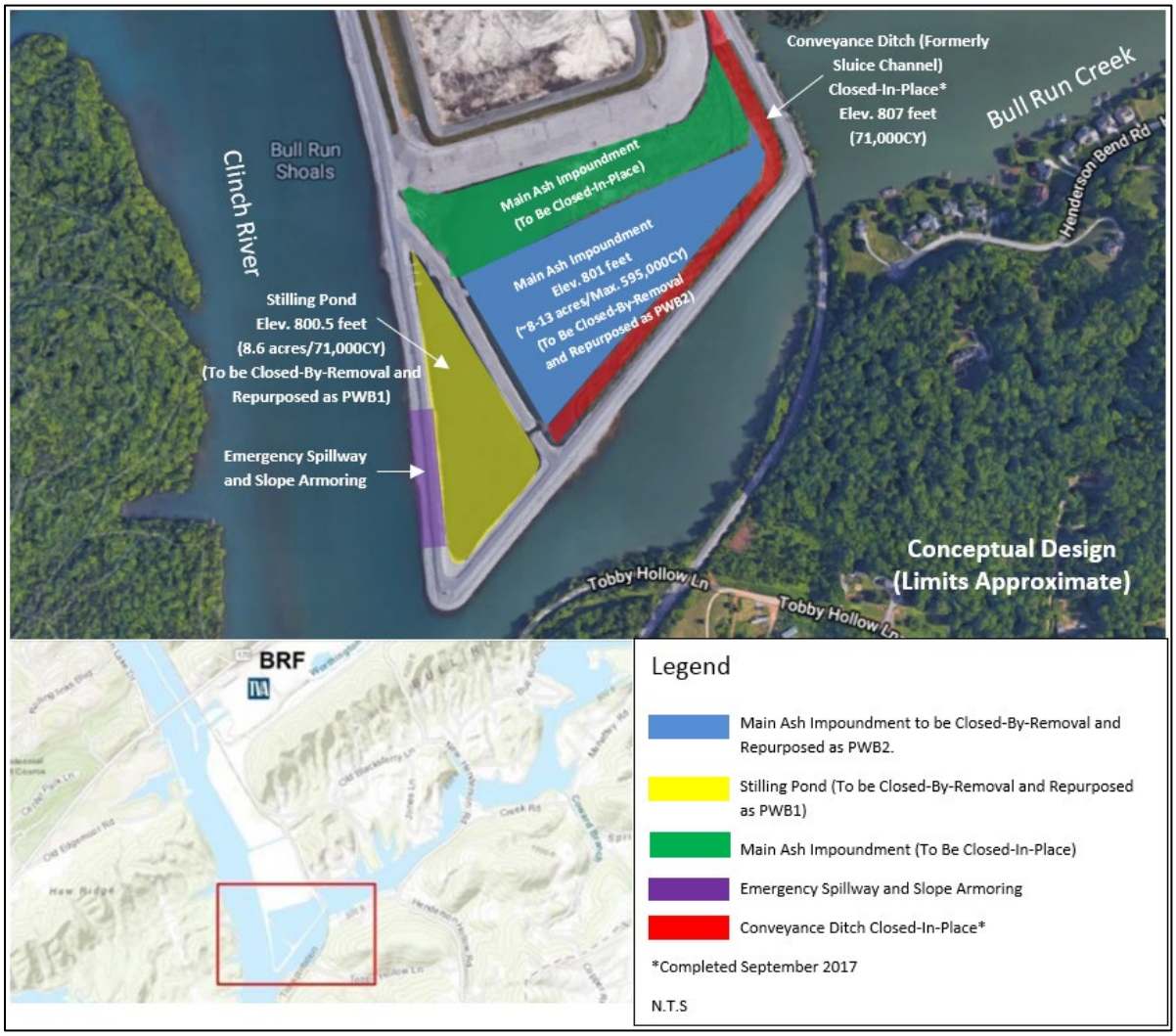

Figure 2-1. Alternative B. Proposed Project Activity Areas.

As part of the PWB infrastructure, an emergency spillway would be constructed along the western side of the perimeter dike that borders the Stilling Pond. (Figure 2-1). The emergency spillway would be created by modifying a section of the existing perimeter dike to have a lower elevation. The spillway would be armored with rip rap, concrete, or a combination of the two on the top and outside slope. Laydown areas would be the same as that described in Part II of the PEIS (TVA 2016) and the prior SEA (TVA 2017a).

2.1.3 Alternative C – Interim Cover of the Main Ash Impoundment and Repurposing a Portion for an Interim Process Water Basin (Interim PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway

Under Alternative C, the Stilling Pond would be Closed-by-Removal and repurposed as a process water basin (PWB1) and the emergency spillway would be constructed as described under Alternative B. However, under this alternative the Main Ash Impoundment would be Closed-in-Place with an interim cover[2]. TVA would repurpose 13 acres of the closed area and use it as an interim process water basin (Interim PWB2). The capping system for the Closure-in-Place would serve as a bottom liner for Interim PWB2 (see Figure 2-2). The new PWBs would receive only storm water flow and non-CCR wastewater from the BRF facility.

To construct this project, the Main Ash Impoundment would be dewatered, regraded and consolidated as necessary to meet closure grades. The Main Ash Impoundment would be capped and Closed-in-Place with an interim cover as described in Part II of the PEIS. A subsurface drainage layer would be installed during construction of PWB2 to manage any water that enters the excavation during the liner placement. Following construction of the subsurface drainage system, the liner for the proposed new Interim PWB2 would be installed. A conceptual grading plan is provided in Appendix B.

During dewatering and construction of PWB2, pore water would be removed from the Main Ash Impoundment, pumped into temporary treatment tanks or boxes, where it would be treated, and discharged through the NPDES permitted Outfall 001. Free water would be pumped and discharged through Outfall 001. Mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. These measures could include but would not be limited to implementing BMPs, wastewater treatment technologies, and/or rerouting or recycling water.

[2] The Interim Cover of the Main Ash Impoundment is temporary pending TDEC approval of a permanent solution. However, if this temporary plan is approved by TDEC as a permanent solution, TVA would evaluate whether additional NEPA review would be required. If TVA determines that additional review under NEPA is required, an additional public comment period would not be necessary since TVA is disclosing to the public now that it could become permanent.

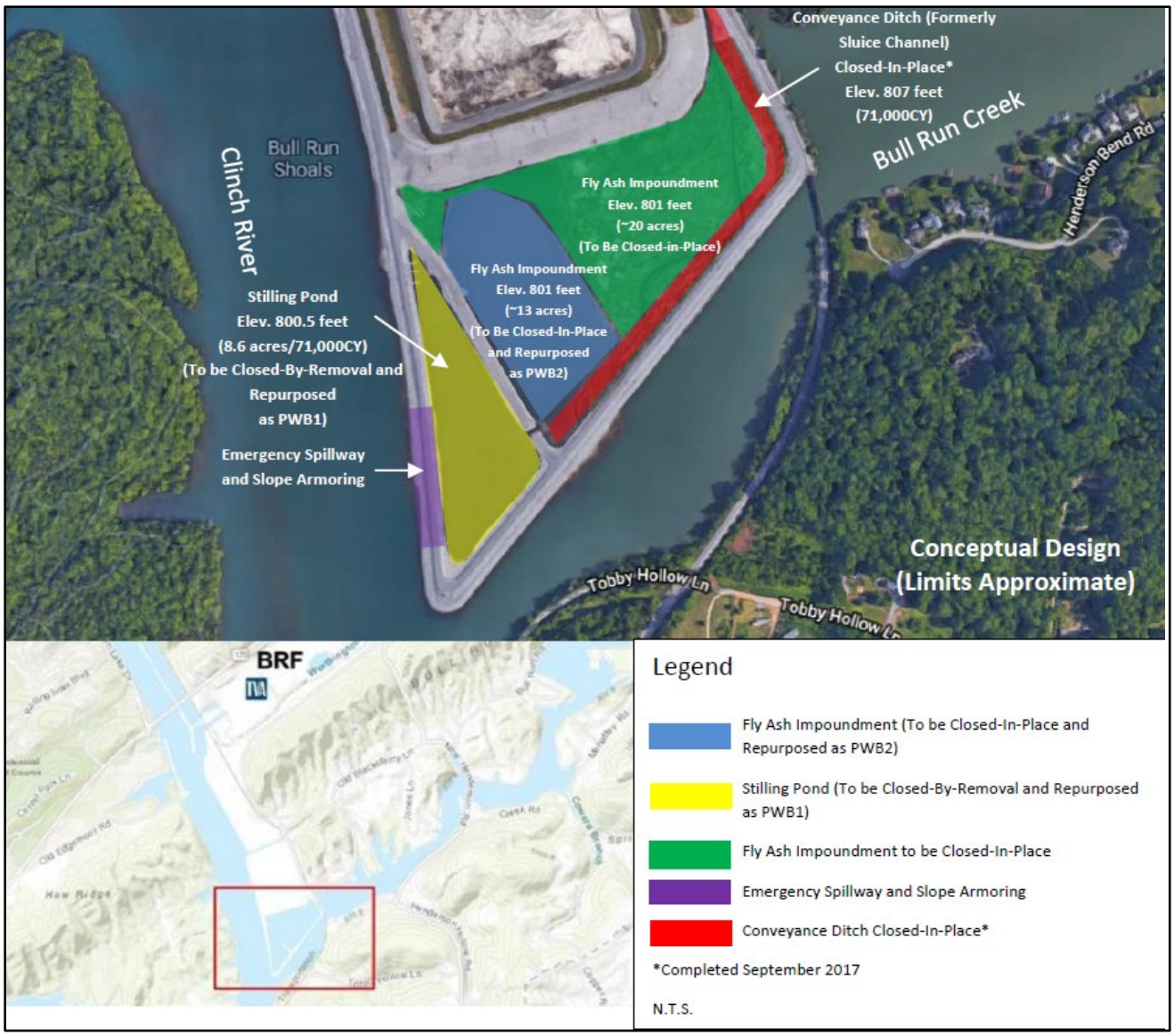

Figure 2-2. Alternative C. Proposed Project Activity Areas.

Table 2-1 summarizes the general characteristics of the Main Ash Impoundment and Stilling Pond under Alternative B and C in comparison to that under the previously considered action described in Part II of the PEIS and the October 2017 SEA.

Table 2-1. Summary of Main Ash Impoundment and Stilling Pond Attributes Under the Original Closure Plan, October 2017 SEA, Alternative B and Alternative C

Attribute	Original Closure-in-Place Alternative Evaluated in Tier II of PEIS	October 2017 Supplemental EA– Main Ash Impoundment Closure-in-Place and Repurposing of the Stilling Pond and a Portion of the Main Ash Impoundment	Alternative B – Closure-in-Place of a Portion of the Main Ash Impoundment, Closure-by-Removal of the remaining portion of the Main Ash Impoundment and Repurposing into a Process Water Basin (PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway	Alternative C – Interim Cover of the Main Ash Impoundment and Repurposing a Portion for an Interim Process Water Basin (Interim PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway
Main Ash Impoundment				
Impoundment Status	Inactive	Inactive	Inactive	Inactive
Size (ac)	33	Closed-in-Place Portion per PEIS: 21.4 Repurposed: 11.6 Total: 33.0	Closed-in-Place Portion: ~20 Closed-by-Removal and Repurposed Portion: ~13 Total: 33	Closed-in-Place Portion: ~20 Closed-in-Place and Repurposed Portion: ~13 Total: 33
CCR Material	Bottom Ash/Fly Ash	Bottom Ash/Fly Ash	Bottom Ash/Fly Ash	Bottom Ash/Fly Ash
CCR Volume (yd^3)	3,500,000	Closed-in-Place: 3,500,000	Covered Portion: ~2,900,000 Closed-by-Removal Portion: ~595,000 Total: 3,500,000	Closed-in-Place: ~3,500,000
Borrow Material	250,000	No borrow soil required	61,000	No borrow soil required
Temporary Laydown Areas (ac)	5 to 10	5 to 10	5 to 10	5 to 10

Attribute	Original Closure-in-Place Alternative Evaluated in Tier II of PEIS	October 2017 Supplemental EA– Main Ash Impoundment Closure-in-Place and Repurposing of the Stilling Pond and a Portion of the Main Ash Impoundment	Alternative B – Closure-in-Place of a Portion of the Main Ash Impoundment, Closure-by-Removal of the remaining portion of the Main Ash Impoundment and Repurposing into a Process Water Basin (PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway	Alternative C – Interim Cover of the Main Ash Impoundment and Repurposing a Portion for an Interim Process Water Basin (Interim PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway
Stilling Pond				
Impoundment Status	Not included in Original Closure Plan	Inactive	Inactive	Inactive
Size (acres)		Closed-in-Place: 8.6 acres (Pond surface ~7 ac, berms: ~1.6 acres)	Closed-by-Removal: 8.6 acres (Pond surface ~7 acres, berms: ~1.6 acres)	Closed-by-Removal: 8.6 acres (Pond surface ~7 acres, berms: ~1.6 acres)
CCR Material		Bottom Ash/Fly Ash	Bottom Ash/Fly Ash	Bottom Ash/Fly Ash
CCR Volume (yd^3)		CCR: ~51,000	CCR: ~51,000 + 20,000 (residual materials) = 71,000	CCR: ~51,000 + 20,000 (residual materials) = 71,000
Borrow Material Volume (yd^3)		No borrow soil required	Borrow required for re-purposed area less than and bounded by total volume included in Tier II of PEIS	Borrow required for re-purposed area less than and bounded by total volume included in Tier II of PEIS
Temporary Laydown Areas		No additional laydown required	No additional laydown required	No additional laydown required

2.2 Summary of Alternative Impacts

Table 2-2 summarizes a comparison of the PEIS - Part II (TVA 2016), the previous SEA (TVA 2017a) and Alternative B and C of this SEA for impacts of the proposed actions associated with the Main Ash Impoundment and the Stilling Pond. This impact summary is limited to those resources reassessed in this SEA as being potentially affected by the proposed actions.

2.3 Identification of Mitigation Measures

Mitigation measures identified in Parts I and II of the PEIS to avoid, minimize, or reduce adverse impacts to the environment are applicable to the proposed action and are summarized below. TVA's analysis of preferred alternative includes mitigation, as required, to reduce or avoid adverse effects. In addition to the items listed below, best management practices would be used throughout the project to minimize erosion, prevent spills, reduce noise, and further reduce potential impacts on environmental resources.

- Fugitive dust emissions from site preparation and construction will be controlled by wet suppression and best management practices (CAA Title V operating permit incorporates fugitive dust management conditions).

- Consistent with EO 13112 as amended by EO 13751 (Invasive Species), disturbed areas will be revegetated with native or non-native, non-invasive plant species to avoid the introduction or spread of invasive species.

- TVA will implement supplemental groundwater mitigative measures that could include monitoring, assessment, or corrective action programs as mandated by state and federal requirements. The CCR Rule and state requirements provide an additional layer of groundwater protection to minimize risk.

2.4 The Preferred Alternative

TVA's preferred alternative is Alternative C, under which the Main Ash Impoundment would be Closed-in-Place with an interim cover and a portion (approximately 13 acres) would be repurposed for use as an interim process water basin (Interim PWB2). The Stilling Pond would be Closed-by-Removal and would also be repurposed for use as a process water basin (PWB1). Alternatives B and C both provide long-term benefits and meet the purpose and need of the project as both these alternatives would eliminate future wet CCR storage and provide a facility for wastewater treatment at BRF and both would result in minimal environmental impacts. However, the results of analysis of material in the Stilling Pond and Main Ash Impoundment indicated that closure of the impoundments as described under Alternative B would result in constructability/timing/safety and potential environmental compliance hazards. Therefore, TVA prefers Alternative C, which avoids these potential impacts. The interim solution for the Main Ash Impoundment would be implemented until a decision on a permanent solution for a disposition of the underlying CCR is made through the 2015 TDEC Commissioner's Order process.

Table 2-2. Summary and Comparison of the Original Closure Plan, October 2017 SEA, and Newly Proposed SEA Alternative B and C (2018) by Resource

Resource	Original Closure-in-Place Alternative Evaluated in Tier II of PEIS	October 2017 Supplemental EA – Fly Ash Impoundment Closure-in-Place and Repurposing of the Stilling Pond and a Portion of the Fly Ash Impoundment	Alternative B – Closure-in-Place of a Portion of the Main Ash Impoundment, Closure-by-Removal of the remaining portion of the Main Ash Impoundment and Repurposing into a Process Water Basin (PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway.	Alternative C – Interim Cover of the Main Ash Impoundment and Repurposing a Portion for an Interim Process Water Basin (Interim PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway
Groundwater	Reduction of hydraulic input reduces risk of migration of constituents to groundwater.	Reduction of hydraulic input reduces risk of migration of constituents to groundwater. Low permeability liner at base of repurposed Main Ash Impoundment and Stilling Pond prevents contact of non-CCR wastewater and storm water with groundwater.	Clean closing a portion of the Main Ash Impoundment and the entire Stilling Pond in conjunction with the PWBs and the capping system used for the remaining portion of the Main Ash Impoundment is expected to enhance groundwater protection by removing 666,000 yd^3 of CCR, by reducing hydraulic inputs to the portion temporarily covered, thereby reducing risk of migration of constituents to groundwater. Low permeability liner at base of repurposed portion of Main Ash Impoundment and Stilling Pond prevents contact of non-CCR wastewater and storm water with groundwater.	Reduction of hydraulic input reduces risk of migration of constituents to groundwater. A low permeability liner at base of the repurposed portion of Main Ash Impoundment and Stilling Pond prevents contact of non-CCR wastewater and storm water with groundwater.
Surface Water	Risk to surface water would be reduced. Construction-related impacts would be negligible.	Risk to surface water would be reduced. Construction-related impacts would be negligible.	Risk to surface water would be reduced. Construction-related impacts would be negligible.	Risk to surface water would be reduced. Construction-related impacts would be negligible.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

Chapter 3 describes existing resources that may be affected by the alternatives and the potential direct and indirect impacts on those resources. Chapter 3 focuses on the impacts resulting from the proposed activities associated with Alternatives B and C. Impacts associated with Alternative A are the same as those summarized in the October 2017 SEA (TVA 2017a) and are not re-assessed in this document.

3.2 Groundwater

3.2.1 Affected Environment

3.2.1.1 Physiographic Setting and Regional Aquifer

BRF is located in the Valley and Ridge Physiographic Province, a northeast-southwest trending series of parallel ridges and valleys composed of folded and faulted Paleozoic sedimentary rock. The primary surface features are mainly the result of differential weathering of various rock types, which include limestone, dolomite, shale, sandstone and siltstone. Residual soil typically ranges in thickness from about 10 to 150 feet.

Alluvial overburden with variable thickness mantles much of the site and has been derived from flood events of the Clinch River. Larger valleys may have a comparatively thin mantle of alluvial soils ranging in size from clay to coarse sand to boulders, and deeply weathered alluvium in the vicinity of streams and rivers may be found both in low-lying areas and on hills, reflecting the dynamic geologic nature of the province. Four different bedrock units underlie the site. These are the Rome Formation, the Conasauga and Knox groups, and the Chickamauga Limestone (URS 2011).

The plant site straddles Bull Run Ridge which is underlain by the Rome Formation. The valley south of Bull Run Ridge is underlain by rocks of the Conasauga Group while the valley north of the ridge is underlain by several sub-units of the Chickamauga Formation (Stantec 2009). Shallow fractures, enlarged by carbonate dissolution, are more common in this formation than any other at the site. Residuum produced from the Chickamauga is a silty clay containing variable amounts of chert. In the main plant area, the majority of this clayey soil has been removed, and the remaining residuum is expected to range in thickness from 0 to about 25 feet.

Groundwater underlying the BRF site is derived from infiltration of precipitation and from lateral inflow along the northwest boundary of the reservation.

All groundwater originating on or flowing beneath the proposed site ultimately discharges to the Clinch River/Melton Hill Reservoir without traversing private property. The subsurface water flow occurs both in a shallow zone just beneath the land surface and in a deeper zone at the bedrock interface (TVA 2012).

The bedrock underlying the main plant area (Chickamauga Formation) may locally exhibit properties in which flow is dominated by fractures enlarged by carbonate dissolution. These

fractures may alternately store and transmit relatively large volumes of water. At other areas of the site underlain by relatively impermeable strata (i.e., the Rome and Conasauga units), groundwater movement is controlled by fractures that may store fairly large volumes but transmit only limited amounts of water (TVA 2012).

TVA is currently conducting a hydrogeological characterization of BRF to address information requests from TDEC about groundwater flow, including bedding planes, faults and joints. This characterization is conducted in accordance with the requirements of the TDEC Commissioner's Order issued to TVA on August 6, 2015 (OGC15-0177) to establish a transparent, comprehensive process for the investigation, assessment, and remediation of risks resulting from the management and disposal of CCR at TVA coal-fired plants in Tennessee, and also under the groundwater monitoring requirements of the EPA Final CCR Rule (TVA 2017b). The monitoring system will be used to confirm that CCR management activities at BRF, including closure of CCR facilities, protect human health and the environment.

3.2.1.2 Groundwater Use

As documented previously (TVA 2002), a 1999 survey of water wells in the BRF vicinity indicated there are 17 domestic wells within approximately 1 mile of the BRF dry ash stacking area. The 1999 survey was confirmed by review of a 2004 database update from TDEC (TVA 2005). In accordance with the Environmental Investigation Plan (EIP) developed in cooperation with TDEC, TVA will conduct an updated water-use survey. The purpose of the water-use survey is to identify private water wells and springs usable by local residents (TVA 2017b). Well depths are unknown, but it is likely that most yield water at a relatively shallow depth in the Chickamauga Formation. Most residences located northeast and northwest of the BRF reservation rely on public water provided by the Clinton Utility Board. None of the residential wells are located downgradient of the proposed facility (TVA 2005). There is no potential for future development of groundwater supplies downgradient of the facility, as all property between the proposed facility and surface water boundaries lies within the BRF reservation (TVA 2012). However, in order to ensure that impacts are minimized, and in accordance with the EIP, TVA in cooperation with TDEC will implement the water use survey, conduct a verification plan to establish well characteristics and groundwater use, and conduct additional sampling and analysis, as appropriate (TVA 2017b).

3.2.1.3 Groundwater Quality

Figure 3-1 identifies the network of existing groundwater monitoring wells in the vicinity of Conveyance Channel and the Main Ash Impoundment. As reported in the PEIS, statistical analyses have been performed on monitoring wells in the immediate vicinity of the Main Ash Impoundment (BRF-1 (background well), BRF-S, BRF-10-51, and BRF-10-52) using laboratory analytical results from 2000 through August 2014. Time series analyses have been developed for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, thallium, tin, vanadium, zinc, turbidity and total suspended solids. The time series for metals are developed using the total metals analysis results.

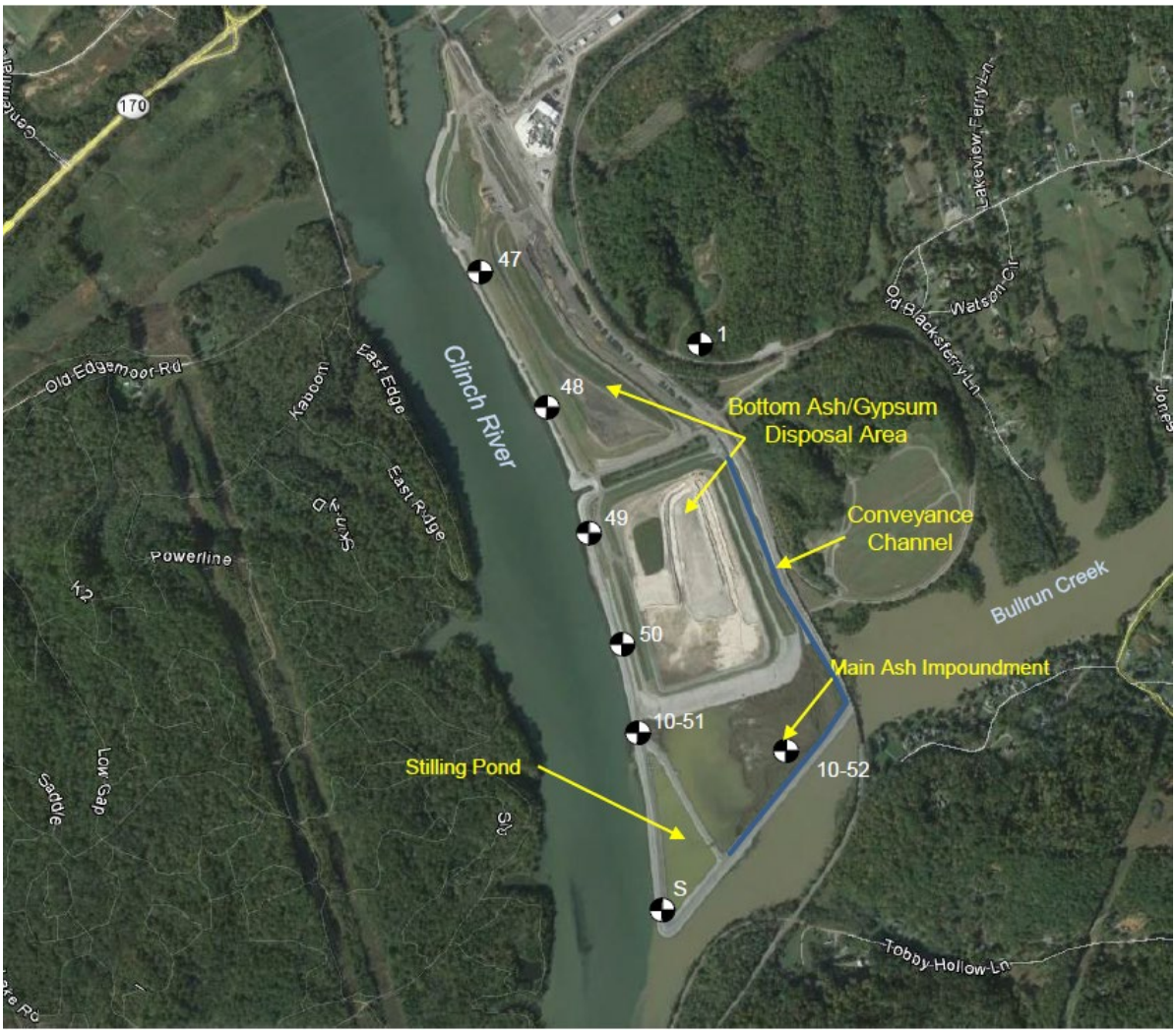

Figure 3-1. Network of Groundwater Monitoring Wells Near Main Ash Impoundment and Stilling Pond at BRF

Analytical data indicated from the samples taken from (BRF-10-52) exceeded the state Ground Water Protection Standard (GWPS) for arsenic of 10 micrograms per liter (ug/L) since sampling began at this well in 2010. Concentrations ranged from approximately 22 to 32 ug/L from 2010 to 2014. Barium at BRF-1 exceeded the GWPS of 2,000 ug/L during the last sampling event in August 2014. The remaining samples and parameters exhibited trends that appear stable or non-detectable and do not exceed their applicable GWPS.

Groundwater analytical data for the last three years (2016-2018) indicate groundwater exceedances of the GWPS for arsenic in well BRF-10-52 which is consistent with past results in which arsenic at BRF-10-52 has exceeded the state GWPS of 10 ug/L since sampling began at this well in 2010. Concentrations have typically ranged from approximately 26 to 34 ug/L and appear stable. The remaining samples and parameters exhibit trends that appear stable or non-detectable and do not exceed their applicable state GWPS.

3.2.2 Environmental Consequences

3.2.2.1 Alternative A – No Action

Under this alternative, the Stilling Pond and the southern portion of the Main Ash Impoundment would be would be closed in place and repurposed for use as PWBs. Repurposing of the southern portion of the Main Ash Impoundment and the Stilling Pond would entail installation of an approved low permeability liner that would isolate surface water above the liner and prevent groundwater contact.

Consequently, as previously described in the prior SEA (TVA 2017a), potential impacts to groundwater from in-place closure of a portion of the Main Ash Impoundment and repurposing of a portion of the Main Ash Impoundment and the Stilling Pond are expected to be minor and beneficial.

3.2.2.2 Alternative B – Closure-in-Place of a Portion of the Main Ash Impoundment, Closure-by-Removal of the Remaining Portion of the Main Ash Impoundment and Repurposing into a Process Water Basin (PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway

Under this alternative, a portion of the Main Ash Impoundment and the entire Stilling Pond would be Closed-by-Removal and would be repurposed for use as non-CCR PWBs. The portion of the Main Ash Impoundment that is not included as part of the repurposed area would be Closed-in-Place with a cover system that adheres to the same standards as the closure plan described in the PEIS (TVA 2016).

As described in the PEIS (TVA 2016), the dewatering and subsequent lack of rainfall infiltration into the CCR materials in the covered portion of the Main Ash Impoundment would provide an immediate reduction in the potential downward influx of leachate moving from these areas. Under Alternative B, reduction of the water level or water pressure in the Main Ash Impoundment is expected to reduce mounding of the surficial aquifer, reduce vertical leaching of CCR constituents and reduce groundwater impacts in a manner similar to that previously described in Part II of the PEIS. The Stilling Pond and Closed-by-Removal portion of the Main Ash Impoundment would be regraded, if necessary, and any residual CCR would be removed, dried and placed in a permitted solid waste facility.

Repurposing of the Closed-by-Removal portion of the Main Ash Impoundment and the Stilling Pond would entail installation of an approved low permeability liner that would isolate surface water above the liner and prevent groundwater contact.

Consequently, as previously described in Part II of the PEIS, proposed impacts to groundwater from the covered portion of the Main Ash Impoundment and the repurposed portion of the Main Ash Impoundment and Stilling Pond following Closure-by-Removal are expected to be beneficial. Additionally, TVA would follow a closure plan approved by TDEC and implement any supplemental mitigation measures required pursuant to the 2015 TDEC Commissioner's Order. Supplemental mitigation could include additional monitoring, assessment, corrective action programs, or other actions deemed appropriate as specified in the Corrective Actions/Risk Assessment Plan. Therefore, impacts to groundwater relative to the previous assessment of the proposed action documented in the prior SEA (TVA 2017a) are similar and minor.

3.2.2.3 Alternative C – Interim Cover of the Main Ash Impoundment and Repurposing a Portion for an Interim Process Water Basin (Interim PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway

Under this alternative, the Stilling Pond would be Closed-by-Removal and repurposed as PWB1 as described under Alternative B.

The Main Ash Impoundment would be Closed-in-Place with an interim cover system, as described in Part II of the PEIS. A portion of the closed impoundment would be repurposed for use as an Interim PWB2. The capping system for the Closure-in-Place would serve as a bottom liner for Interim PWB2.

As described in the PEIS, the dewatering and subsequent lack of rainfall infiltration into the CCR materials in the impoundment would provide an immediate reduction in the potential downward influx of leachate moving from the impoundment. Under Alternative C, reduction of the water level or water pressure in the Main Ash Impoundment is expected to reduce mounding of the surficial aquifer, reduce vertical leaching of CCR constituents and reduce groundwater impacts in a manner similar to that previously described in Part II of the PEIS. The Main Ash Impoundment would be regraded and consolidated and compacted in place. These actions would not increase the potential for leaching of CCR constituents to the groundwater as any CCR material left in place would be similarly dewatered and closed with an approved cover system. A foundation drainage layer would be installed beneath the liner system of the repurposed impoundment to remove water under the liner system during construction, thus reducing the uplift pressure on the liner system.

Repurposing of the southern portion of the Main Ash Impoundment and the Stilling Pond would entail installation of an approved low permeability liner that would isolate surface water above the liner and prevent groundwater contact.

Consequently, as previously described in Part II of the PEIS, proposed impacts to groundwater from in-place closure of a portion of the Main Ash Impoundment and repurposing of a portion of the Main Ash Impoundment and the Stilling Pond are expected to be beneficial. Additionally, TVA would implement any supplemental mitigation measures required pursuant to the 2015 TDEC Commissioner's Order 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 2017b).

3.3 Surface Water

3.3.1 Affected Environment

3.3.1.1 Regional Surface Water Systems

The regional surface water features and water quality in the vicinity of the BRF plant is detailed in Part II of the PEIS for Surface Water (TVA 2016).

3.3.1.2 Surface Water of BRF Ash Impoundments

As described in Part II of the PEIS, BRF has several existing wastewater streams that are permitted under NPDES Permit TN0005410. Because the Main Ash Impoundment discharge (Outfall 001) is the primary wastewater stream potentially affected by the proposed project, it is the only existing BRF wastewater discharge stream discussed here. About 8.61 million gallons per day (MGD) of effluent is discharged from the Main Ash Impoundment through NPDES Outfall 001 at river mile 46.3. Primary contributing sources (greater than 1 MGD) include the sump flows and low volume waste streams, boiler bilge sump, main station sump (equipment cooling water and leakage, service bay floor drainage, plant leakage – boilers, and roof drains) and the stack yard sump. The current NPDES permit contains limitations on the ash impoundment discharge with respect to pH, oil and grease, and total suspended solids. This permit also requires reporting of toxicity, total nitrogen, cyanide and 15 metals including total aluminum, antimony, arsenic, barium, beryllium, cadmium, copper, iron, lead, mercury, nickel, selenium, silver, thallium, and zinc. Recent data indicates that the pH of the Main Ash Impoundment discharge ranged from 7.01 to 8.29; the oil and grease levels ranged between 4.27 and 5.88 mg/L; and total suspended solids levels ranged between 2.5 mg/L and 10 mg/L (TVA 2016). All discharges were within regulatory limits. Additionally, BRF has met aquatic whole effluent toxicity monitoring, which further indicates that this plant's discharge is not 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 instream mixing concentration from BRF (Table 3-1).

Results of the mixing analysis summarized in Table 3-1 demonstrates that all of the constituents, except thallium, met the TDEC strictest 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.

Table 3-1. BRF Mixing Analysis of Historical Operations

Element	Current Baseline	Current Operations		Water Quality Criteria * Conc., (mg/L)
	Intake Conc. (mg/L)	Ash Stilling Pond*** Conc. (mg/L)	Total Discharge Conc. at Clinch River 1Q10 (mg/L)	
Aluminum	0.120	0.282	0.13661	
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	
Lead	<0.001	0.001	0.00060	0.005
Manganese	0.048	0.108	0.05415	
Mercury	0.00000089	0.00000228	0.0000010	0.00005
Nickel	0.0014	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	0.12
lbs/day = conc. in mg/L X flow in MGD X 8.34 lbs/gal.				
CCW Flow	129.3			
Stilling Pond Flow	14.8			
Flows 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				

3.3.2 Environmental Consequences

3.3.2.1 Alternative A – No Action

Under this alternative, construction and operational effects would be identical to that described in the prior SEA (TVA 2017a). The mixing analysis indicated that the proposed repurposed PWBs are expected to maintain or improve the quality of water that would be discharged. Additionally, wastewater would be managed and treated in lined basin(s), thus eliminating any potential seepage. Furthermore, mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. These measures could include but would not be limited to implementing BMPs, wastewater treatment technologies, and/or rerouting or recycling water. Therefore, with proper treatment implementation, these waste streams from the proposed impoundment would not be expected to negatively impact surface water quality. Additionally, TVA would conduct a characterization to confirm no significant impacts to the Clinch River. The waters would be analyzed for metals and other parameters.

Because surface water flow and potential underseepage and groundwater releases to surface waters would be eliminated, and because all work would be done in compliance with applicable regulations, permits, and best management practices, potential direct and indirect impacts of this alternative to surface waters would be negligible.

3.3.2.2 Alternative B – Closure-in-Place of a Portion of the Main Ash Impoundment, Closure-by-Removal of the Remaining Portion of the Main Ash Impoundment and Repurposing into a Process Water Basin (PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway.

Under this alternative, approximately 20 acres of the 33-acre Main Ash Impoundment would be Closed-in-Place. The remaining portion of the Main Ash Impoundment and the Stilling Pond would be Closed-by-Removal, lined and repurposed for the PWB system.

By using engineering controls such as temporary storage tanks or boxes, the portion of the Main Ash Impoundment that would be Closed-in-Place would be dewatered and ultimately discharged through the NPDES permitted outfall. Mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. Once dewatering is completed all remaining CCR material would be consolidated and compacted in place. A cover system would be installed similar to that described in the PEIS (TVA 2016). A foundation drainage layer would be installed during construction of PWB1 to remove water under the liner system during construction, thus reducing the uplift pressure on the liner system. This system would have a discharge that would be directed into the Main Ash Impoundment and is not expected to be needed once construction is completed.

Under the proposed action, all systems currently discharging wastewater to the Main Ash Impoundment and Stilling Pond would be rerouted to the proposed PWB system. Surface water management under this alternative would be similar to that described in the prior SEA.

The proposed emergency spillway of the PWB1 would not impact any surface water under normal operating conditions. Water release at the spillway would be for emergency purposes only.

Wastewater generated during construction activities may include construction storm water runoff, dewatering of work areas, domestic sewage, non-detergent equipment washings, dust control, and hydrostatic test discharges. The scope and magnitude of wastewater generated under this alternative is expected to be similar to that evaluated for the selected alternative in the prior SEA and bounded by the description already provided in the PEIS (Section 3.7 Surface Water) (TVA 2017a)

As stated in the prior SEA, the main operational change to occur with the closure of the Main Ash Impoundment and the Stilling Pond is the onsite storm water and wastewater operation that is currently treated and discharged from the Main Ash Impoundment and Stilling Pond. Re-routing of these waste streams would use onsite non-CCR impoundments and the lined process trench to enable proper handling and treatment of the waste streams. Mitigation measures, such as storm water BMPs and wastewater treatment would be employed, as needed, to mitigate any pollutant discharge.

The proposed repurposed PWBs are expected to maintain or improve the quality of water that would be discharged. Additionally, wastewater would be managed and treated in lined basin(s), thus eliminating any potential underseepage. Furthermore, mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. Therefore, potential direct and indirect impacts of this alternative to surface waters would be negligible.

3.3.2.3 Alternative C – Interim Cover of the Main Ash Impoundment and Repurposing a Portion for an Interim Process Water Basin (Interim PWB2), Closure-by-Removal of the Stilling Pond and Repurposing into a Process Water Basin (PWB1), and Development of a Process Water Basin Emergency Spillway

Under this alternative the 33-acre Main Ash Impoundment would be Closed-in-Place with an interim cover and the Stilling Pond would be Closed-by-Removal using a cover system similar to that described in the PEIS (TVA 2016). A portion of the Main Ash Impoundment (approximately 13 acres) and the Stilling Pond would be repurposed into PWBs.

By using engineering controls, such as temporary storage tanks or boxes, the Main Ash Impoundment would be dewatered and ultimately discharged through the NPDES permitted outfall. Mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. A foundation drainage layer would be installed during construction of PWB1 to remove water under the liner system during construction, thus reducing the uplift pressure on the liner system. This system would have a discharge that would be directed into the Main Ash Impoundment and is not expected to be needed once construction is completed.

All remaining CCR material would be consolidated and compacted in place. All systems currently discharging wastewater to the impoundment would be rerouted to the proposed PWBs.

Storm water from the closed Main Ash Impoundment would be routed through the proposed PWBs. Some storm water would be conveyed directly from the approved closure system and the remaining areas would drain to the lined Conveyance Channel, which would discharge into the proposed PWBs.

Wastewater generated during the proposed project would be similar to that described for Alternative B and would be the same as, and bounded by the description already provided in the PEIS (Section 3.7 Surface Water).

As with Alternative B, the proposed repurposed PWB system is expected to maintain or improve the quality of water that would be discharged. Additionally, wastewater would be managed and treated in lined basin(s), thus eliminating any potential underseepage. Furthermore, mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. Therefore, potential direct and indirect impacts of this alternative to surface waters would be negligible.

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

There would be no changes in short-term use or long-term productivity of the land designated for ash impoundment closure or repurposing as part of the BRF wastewater

treatment system. These facilities would be located within the property already used by TVA for ash management or water treatment. Additionally, the proposed actions occur within a landscape subject to on-going human disturbance and maintenance; therefore, the short-term use of the land is not expected to significantly alter long-term productivity of wildlife or other natural resources.

3.5 Irreversible and Irretrievable Commitments of Resources

As described in Part I of the PEIS, there would be minor irreversible and irretrievable commitments due to the preferred action. No irreversible and irretrievable commitments associated with groundwater or surface water resources other than those discussed in the PEIS would result from Alternative B or C.

3.6 Cumulative Effects

Cumulative impacts are defined in the Regulations for Implementing the Procedural Provisions of NEPA (CEQ 1997) as follows:

> "Cumulative impact is 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 non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The cumulative impacts of the proposed closure and repurposing of the Main Ash Impoundment and the Stilling Pond was assessed in this SEA and in combination with the previous assessments described in the PEIS (TVA 2016) and the October 2017 SEA (TVA 2017a). Relevant past, present, and reasonably foreseeable future actions that have the potential to, in conjunction with the proposed action, have a cumulatively greater effect on the environment are summarized in Table 3-2.

Table 3-2 Summary of Other Past, Present, or Reasonably Foreseeable Future Actions in the Vicinity of the Proposed Action

Action	Description	Timing
Mechanical Dewatering Facility	Construction and operation of a mechanical dewatering facility for dry storage of ash and gypsum at BRF	Past
House Demolition	166 acres purchased adjacent to BRF to expand plant boundary	Past
New CCR Dry Storage Landfill	TVA is evaluating options for management of CCRs generated at BRF, including construction of a landfill	Reasonably foreseeable future action
Future Retirement of BRF	Retirement of BRF	Reasonably foreseeable future action
Deconstruction and Demolition of BRF	Disposition of BRF	Reasonably foreseeable future action
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	Reasonably foreseeable future action

To address cumulative impacts, the existing affected environment surrounding the proposed project area was considered in conjunction with the environmental impacts presented in Chapter 3. These combined impacts are defined by the Council on Environmental Quality as “cumulative” in 40 Code of Federal Regulations 1508.7 and may include individually minor but collectively significant actions taking place over a period of time. The potential for cumulative effects to each of the identified environmental resources of concern are analyzed below.

This analysis is limited only to those resource issues potentially adversely affected by preferred alternative project activities or connected actions. Accordingly, air quality, climate change, geology, soils, aquatic ecology, land use, noise, solid and hazardous waste, environmental justice, transportation. vegetation, wildlife, threatened and endangered species, floodplains, wetlands, cultural and historic resources, managed and natural areas, parks and recreation, socioeconomics, utilities and service systems, and public health and

safety and hazardous materials are not included in this analysis as these resources are either not adversely affected, or the effects are considered to be minimal or beneficial.

Primary adverse cumulative effects of the proposed actions as described in the preceding sections of Chapter 3 are related to the potential additive and overlapping effects on groundwater and surface water.

No other foreseeable future actions are known within the immediate project area potentially affected by the proposed action. Because the proposed action would result in environmental effects that are equal to or less than those identified in Part II of the PEIS and would not contribute to impacts to resources potentially affected by the other reasonably foreseeable future actions, no additional cumulative effects are expected with the proposed action.

CHAPTER 4 – LIST OF PREPARERS

4.1 NEPA Project Management

Name:	**Ashley Farless, PE, AICP (TVA)**
Education:	B.S., Civil Engineering
Project Role:	TVA Project Manager
Experience:	Professional Engineer and Certified Planner, 15 years in NEPA Compliance

Name:	**Bill Elzinga (Wood)**
Education:	M.S. and B.S., Biology
Project Role:	Project Manager, NEPA Coordinator
Experience:	34 year's experience managing and performing NEPA analyses for electric utility industry, and state/federal agencies; ESA compliance; CWA evaluations

4.2 Other Contributors

Name:	**James Feild, PhD (Wood)**
Education:	M.S., Hydrogeology and B.S., Marine Geology
Project Role:	Groundwater
Experience:	18 year's experience in Remediation, Investigation, Compliance, Drilling and Well Installation, Subsurface Hydrogeology, Fractured Rock Hydrogeology, Quality Assurance, Health & Safety, Waste Management and Restoration)

Name:	**A. Chevales Williams (TVA)**
Education:	B.S. Environmental Engineering
Project Role:	Surface Water
Experience:	12 years of experience in water quality monitoring and compliance; 10 years in NEPA planning and environmental services.

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CHAPTER 5 – LITERATURE CITED

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Appendix A – Public and Agency Comments

The revised Draft SEA was released for a public review and comment on April 22, 2019. The availability of the revised Draft SEA was announced in local publications. TVA notified local, state, and federal agencies and federally recognized tribes of its availability through their required consultations. Comments were accepted through May 13, 2019, via TVA's Web site, mail, and e-mail.

TVA received comments on the revised Draft SEA from TDEC, EPA, the Anderson County Board of Commissioners, and one member of the public. The Sierra Club submitted a petition that was signed by 96 individuals, 36 of which added a personal comment. In addition, the Southern Environmental Law Center and five other environmental advocacy groups submitted a 10-page letter with hundreds of pages of attachments. The other groups were: Appalachian Voices, Southern Alliance for Clean Energy, Statewide Organizing for Community eMpowerment, Tennessee Chapter of the Sierra Club, and Tennessee Citizens for Wilderness Planning (collectively referred to as Environmental Advocacy Groups).

Most of the comments from the public and the Environmental Advocacy Groups opposed the Preferred Alternative and expressed support for an alternative that included removal of CCR from the impoundments and disposal in an offsite location. TDEC comments requested clarification on CCR characteristics, waste disposal, constructability and clarification on permits. The EPA noted the proposed action would have no significant direct, indirect, or cumulative impacts on human health and the environment and requested TVA adhere to BMPs and permit requirements to reduce risk to surface water. The Anderson County Board of Commissioners submitted a letter requesting TVA to return the site back to its natural state to allow future development of the site. The Board also attached a previously submitted letter suggesting TVA invest in development of natural gas and solar facilities at BRF. A private citizen requested that TVA invest in a new technology to address CCR at BRF. Comments received and TVA's responses to those comments are provided in Table A-1 below. A copy of each of the comments is included at the end of this section. Attachments submitted with comments are on file with TVA.

Table A-1. Bull Run Fossil Plant Ash Impoundment Closure Project
Supplemental Environmental Assessment
Response to Comments

No.	Name	Group	Comment	Response
1	Amanda Garcia	Environmental Advocacy Groups	Several of the Environmental Advocacy Groups have provided comments on TVA's Environmental Impact Statement for Ash Impoundment Closure ("Ash Closure EIS") and the 2017 Supplemental EA for Bull Run. Several of the Environmental Advocacy Groups have also made known to TDEC their view that TVA is not complying with the federal CCR Rule at its fossil plant sites. In addition, SELC provided comments to TDEC regarding TVA's previous claim that it would "beneficially reuse" coal ash from the Bottom Ash Disposal Area in the closure of the Fly Ash Pond at Bull Run. Previous letters are attached to the comments.	Comment noted. TVA acknowledges receipt of these comments and has considered them, as appropriate. TVA disagrees with the assertion that it is out of compliance with the federal CCR Rule. Final closure methods will be determined through the TDEC Commissioner's Order process.
2	Amanda Garcia	Environmental Advocacy groups	TVA has not identified any reason why the process water basin—or series of process water basins for that matter—must be located within the footprint of the Main Ash Impoundment. The 2019 SEA identifies a need for ongoing wastewater treatment at Bull Run, and further indicates that during the construction period under either Alternative B or C, "TVA is at risk for exceeding NPDES permit limits during storm events or exceeding the basin's capacity." TVA explains that even its preferred alternative, Alternative C, would take ten months to construct. Based on this discussion, it appears that an equally if not more appropriate alternative would be to construct the process water basin or series of basins in an area that is not currently an unstable, unlined, leaking pit full of coal ash.	In 2017-2018, TVA evaluated 5 potential on-site locations for additional treatment capacity. After reviewing available real estate, constructability, sequencing impacts, schedule, and other factors, it was determined that the Main Ash Pond was preferable as it provided a suitable location and could be permitted and constructed in a timely manner. TVA has conducted detailed design calculations that demonstrate adequate local and global stability factors of safety for conditions both during and after construction. This will be detailed in the Ash Management Plan to be submitted to TDEC. The Ash Management Plan identifies key procedures and practices that would be incorporated into the proposed closure of the impoundments. For instance, the plan identifies instrumentation and monitoring that will be implemented to monitor stability during construction. The plan, also includes the results of the global slope stability analysis conducted to assure the closure design meets acceptable standards for maintaining minimum static factors of safety for slope stability.

No.	Name	Group	Comment	Response
3	Amanda Garcia	Environmental Advocacy groups	TVA's current NPDES permit purports to authorize hypothetical process water basins that discharge to Outfall 001. However, the need to obtain a permit modification, which would be required in order for TVA to construct a new outfall, is not a valid basis for failing to consider an alternative.	The location of the process water basins was not selected based on the location of the permitted outfall (Outfall 001). As indicated in the response to Comment 2, TVA considered available real estate, constructability, sequencing impacts, schedule, and other factors in the selection of the location of the process water basin. For any alternative, mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria.
	Amanda Garcia	Environmental Advocacy groups	TVA's discussion of why it prefers to leave the ash in place under Alternative C focuses on worker safety. However, TVA's discussion in the 2019 SEA indicates that the primary cause of TVA's safety concerns is actually TVA's abbreviated construction schedule for the process water basin, not removal of the ash if done properly. TVA must take the time to construct a safe, functional process water basin in an appropriate location and to safely close the Main Ash Impoundment in a manner that complies with the federal Coal Ash Rule while also protecting public health and our waterways from TVA's coal ash pollution properly.	TVA considered many factors in the development of the preferred alternative, including the Closure-by-Removal over an extended construction period (Alternative B). However, as stated in Section 2.4, Alternative C is preferred because this alternative avoids potential impacts associated with four separate factors: engineering constructability, timing, safety and potential environmental compliance hazards. Alternative C balances each of these factors and as such the decision to select Alternative C is not simply based on an abbreviated construction schedule. The abbreviated schedule is relevant to ensure consistent compliance with the site's NPDES permit. However, in planning for an abbreviated schedule TVA has not diminished the importance of the other listed factors. Should closure-by-removal of the Main Ash Impoundment be determined under the TDEC Commissioner's Order or otherwise to be the appropriate corrective action for the unit, the abbreviated schedule will be moot and TVA will take as much time as needed to safely conduct the work and will maintain all appropriate safety measures.
5	Amanda Garcia	Environmental Advocacy groups	TVA has not explained why it cannot construct its process water basins elsewhere. TVA's ongoing need to comply with its NPDES permit should be addressed separately from its equally applicable obligation to comply with the federal Coal Ash Rule and close the leaking, unlined Main Ash Impoundment in a responsible way. Addressing these legal obligations separately will help ensure that both workers and the public's resources are protected from TVA's coal ash pollution.	Please see response to Comment 2. TVA is taking responsible steps to balance real estate constraints, constructability, sequencing impacts, schedule, and other factors. Process Water Basin 1 will be lined and constructed over clay. Process Water Basin 2 is an interim measure pending completion of numerous environmental studies taking place under the TDEC Commissioner's Order. Although TVA continues to gather additional data under the CCR Rule and the TDEC Commissioner's Order, a significant amount of

No.	Name	Group	Comment	Response
				data already exists, and none of it indicates that the CCR at Bull Run is contaminating drinking water or that the constituents within the CCR at Bull Run are migrating offsite at harmful levels.
6	Amanda Garcia	Environmental Advocacy groups	TVA states that "the soft, fine-grained nature of the ash in the Main Ash Impoundment would require specialized, less efficient, amphibious equipment and dewatering methods to prevent local stability issues from posing a safety risk for construction personnel." TVA also explains that both the amphibious equipment and extended drying durations would require more time "to ensure operator safety." TVA then explains that it wants to construct the process water basin on top of the Main Ash Impoundment within a ten-month timeframe in order to make use of the "series" of process water basins it has designed. From this discussion, it appears that closure by removal could be accomplished safely if TVA took adequate time to ensure worker safety, rather than rushing through to process in order to install an ill-conceived—and likely short-lived—process water basin.	The proposed alternative provides for personnel safety by limiting the depth to which the existing site is regraded. This arrangement will allow for passive treatment of waste stream flows while the TDEC Commissioner's Order process is completed.
7	Amanda Garcia	Environmental Advocacy groups	The 2019 SEA does not explain how its determination that the Main Ash Impoundment is too structurally weak to support excavation on an expedited basis can be reconciled with its determination that the Main Ash Impoundment is an appropriate location for a process water basin to be installed on top of it on an equally expedited basis. If the ash is soft enough to require amphibious equipment and long drying times, how can it be strong enough to support a process water basin at all, let alone on a shorter time horizon?	TVA has conducted detailed design calculations that show adequate local and global stability factors of safety for conditions both during and after construction. While localized instability may be encountered during the removal process, overall berm stability will be maintained to ensure proper long-term safety and integrity of the berms. As noted in the response to Comment 6, the proposed alternative limits the depth to which the existing site is regraded which provides for personal safety.. Detailed design of the proposed PWB2 will ensure adequate factors of safety for stability are provided. Calculations will be provided to TDEC as part of the Ash Management Plan.

No.	Name	Group	Comment	Response
8	Amanda Garcia	Environmental Advocacy groups	TVA has also failed to consider a full range of alternatives for closure by removal of the Main Ash Impoundment, including but not limited to: (1) closure by removal over a longer time horizon to account for worker safety; (2) closure by removal and recycling of all or a portion of the ash.	Closure by removal over a longer time horizon to account for worker safety was considered in Alternative B; however, as described in Section 1.1, this would extend the period during which TVA would be at risk for exceeding NPDES permit limits. Review of historic ash quality data indicates that the fly ash contained in the Main Ash Impoundment is of marginal quality and would require significant processing and beneficiation to be suitable for reuse. The impoundment contains a mixture of fly ash, bottom ash and coal pulverizer rejects, including pyrites. This combination would require extensive screening and most likely grinding prior to beneficiation. The relatively low volume of material in the impoundment would not generate sufficient sales revenue to justify the cost of screening, grinding and construction and operation of a beneficiation facility.
9	Amanda Garcia	Environmental Advocacy groups	Alternative C is unreasonable because the federal Coal Ash Rule does not allow TVA to leave coal ash permanently submerged in groundwater.	TVA disagrees with the assumptions and conclusions set forth in Comment 10, including the commenter's legal interpretation of the closure in place performance standards. During the post-closure period of at least 30 years for a CCR unit that is closed in place, any release of CCR or contaminated leachate from the CCR unit into groundwater is addressed through the Rule's groundwater monitoring and corrective action requirements. *See* 40 C.F.R. § 257.104(b)(3) (2018) (stating that post closure care includes "[m]aintaining the groundwater monitoring system and monitoring the groundwater . . . ."); *see also* 80 Fed. Reg. at 21426 ("In addition, a mandatory 30 year period ensures that if problems do arise with respect to a final cover system, the groundwater monitoring and corrective action provisions of the rule will detect and address any releases from the CCR unit, at least during the post-closure care period.").

No.	Name	Group	Comment	Response
10	Amanda Garcia	Environmental Advocacy groups	In 2016, TVA determined it would leave coal ash permanently submerged in and contaminating groundwater in and under the Main Ash Impoundment. As we have explained in previous letters, the federal Coal Ash Rule does not allow TVA to leave coal ash permanently submerged in groundwater, indefinitely polluting the groundwater and adjacent surface water. Among other requirements, the performance standards governing closure in place require a utility to demonstrate that closure will: (i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere; (ii) Preclude the probability of future impoundment of water, sediment, or slurry; and, in order to achieve structural stability, (iii) Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues. Where coal ash is submerged in groundwater, these standards cannot be satisfied.	TVA disagrees with the assumptions and conclusions set forth in Comment 11, including the commenter's legal interpretation of the closure in place performance standards. During the post-closure period of at least 30 years for a CCR unit that is closed in place, any release of CCR or contaminated leachate from the CCR unit into groundwater is addressed through the Rule's groundwater monitoring and corrective action requirements. See 40 C.F.R. § 257.104(b)(3) (2018) (stating that post closure care includes "[m]aintaining the groundwater monitoring system and monitoring the groundwater . . . .); *see also* 80 Fed. Reg. at 21426 ("In addition, a mandatory 30 year period ensures that if problems do arise with respect to a final cover system, the groundwater monitoring and corrective action provisions of the rule will detect and address any releases from the CCR unit, at least during the post-closure care period."). In addition, this system is interim, pending the ultimate decision under the TDEC Commissioner's Order concerning the final closure method.
11	Amanda Garcia	Environmental Advocacy groups	Because the Project would result in the closure of the Main Ash Impoundment in place, it would leave coal ash permanently submerged in and contaminating groundwater. This would constitute open dumping in violation of the federal Coal Ash Rule, making Alternative C an unreasonable, illegal alternative and preventing TVA from accomplishing its purpose to comply with the federal Coal Ash Rule.	TVA disagrees with the assumptions and conclusions set forth in Comment 12, including the commenter's legal interpretation of the closure in place performance standards. During the post-closure period of at least 30 years for a CCR unit that is closed in place, any release of CCR or contaminated leachate from the CCR unit into groundwater is addressed through the Rule's groundwater monitoring and corrective action requirements. See 40 C.F.R. § 257.104(b)(3) (2018) (stating that post closure care includes "[m]aintaining the groundwater monitoring system and monitoring the groundwater . . . .); see also 80 Fed. Reg. at 21426 ("In addition, a mandatory 30 year period ensures that if problems do arise with respect to a final cover system, the groundwater monitoring and corrective action provisions of the rule will detect and address any releases from the CCR unit, at least during the post-closure care period.").

No.	Name	Group	Comment	Response
				In addition, this system is interim, pending the ultimate decision under the TDEC Commissioner's Order concerning the final closure method.
12	Amanda Garcia	Environmental Advocacy groups	As discussed in Section I above and previous comments, coal ash in the Main Ash Impoundment is submerged in and contaminating groundwater. Because the Project would result in the closure of the Main Ash Impoundment in place, it would leave coal ash permanently submerged in and contaminating groundwater. This would constitute open dumping in violation of the federal Coal Ash Rule, making Alternative C an unreasonable, illegal alternative and preventing TVA from accomplishing its purpose to comply with the federal Coal Ash Rule.	TVA disagrees with the assumptions and conclusions set forth in Comment 13, including the commenter's legal interpretation of the closure in place performance standards. During the post-closure period of at least 30 years for a CCR unit that is closed in place, any release of CCR or contaminated leachate from the CCR unit into groundwater is addressed through the Rule's groundwater monitoring and corrective action requirements. See 40 C.F.R. § 257.104(b)(3) (2018) (stating that post closure care includes "[m]aintaining the groundwater monitoring system and monitoring the groundwater . . . .); *see also* 80 Fed. Reg. at 21426 ("In addition, a mandatory 30 year period ensures that if problems do arise with respect to a final cover system, the groundwater monitoring and corrective action provisions of the rule will detect and address any releases from the CCR unit, at least during the post-closure care period.").

No.	Name	Group	Comment	Response
13	Amanda Garcia	Environmental Advocacy groups	Groundwater monitoring of the Main Ash Impoundment was initiated in April 2019. TVA is required to prepare its initial groundwater monitoring and corrective action report by August 1, 2019. Depending on the results of the initial groundwater monitoring for the Main Ash Impoundment, TVA may be required to begin monitoring the Main Ash Impoundment more intensively and initiate corrective action for groundwater contamination. The 2019 SEA does not acknowledge the possibility that it may need to take corrective action under the federal Coal Ash Rule.	TVA is following the requirements and schedules set forth in the CCR Rule for groundwater monitoring for the Stilling Pond and Main Ash Impoundment, which are inactive units under the CCR Rule. On April 17, 2019, pursuant to 40 CFR 257.100(e)(5)(i), TVA initiated detection monitoring for these units, which included obtaining a minimum of eight independent baseline samples. A statistical evaluation must be completed to determine whether there are statistically significant increases over background levels for Appendix III constituents. If there is a statistical exceedance, and TVA does not perform a successful alternative source demonstration, then TVA must establish an assessment monitoring program for Appendix IV constituents. The initial annual groundwater and corrective action report, which TVA will prepare by August 1, 2019, will contain the data described above and will explain the status of the monitoring program for these units. The CCR Rule relies on the groundwater monitoring and corrective action requirements to address potential releases to groundwater from units that are closed-in-place. Should TVA establish an assessment monitoring program that indicates statistically significant levels of Appendix IV constituents above site-specific groundwater protection standards, then TVA will initiate an assessment of corrective measures under the CCR Rule and appropriate corrective measures will be implemented in accordance with applicable CCR Rule requirements and timeframes.
14	Amanda Garcia	Environmental Advocacy groups	TVA acknowledges in the 2019 SEA, TDEC is conducting an ongoing investigation into groundwater and surface water pollution at Bull Run and may also require TVA to take corrective action to address this pollution. Constructing a process water basin on top of coal ash in the leaking, unlined Main Ash Impoundment now could unreasonably make more difficult future corrective action to address TVA's pollution under the federal Coal Ash Rule and the Commissioner's Order.	The Preferred Alternative includes placement of a geomembrane liner and stone on top of re-contoured CCR in the Main Ash Pond. If removal of the CCR in this unit is required under the federal Coal Ash Rule or the TDEC Commissioner's Order the geocomposite liner will be removed. In the interim, the presence of the geomembrane liner will prevent infiltration into the underlying CCR. TVA does not feel we will be limited on any corrective measures per the proposed plan.

No.	Name	Group	Comment	Response
15	Kendra Abkowitz	TDEC	In Section 1.1 on page 3, TVA fails to discuss that some CCR material may be placed below the water table. If CCR material is placed below the water table, consideration of excavation and removal activities of CCR material should be clearly considered in the Final SEA. If CCR material is not placed below the water table, it should be explicitly stated in the Final SEA.	A detailed investigation is currently underway as part of the TDEC Commissioner's Order. This investigation will aid in the determination of whether or to the extent to which CCR in the units are in contact with groundwater at BRF. Also, please note that this is an interim solution and as such the results contained in the final SEA are not dependent on the results of that investigation. However, the SEA does incorporate the analysis in the PEIS which concluded that whether or not a CCR impoundment intersects with a groundwater table, either closure method will still improve groundwater quality (reduce groundwater contamination) and Closure-by-Removal would benefit groundwater quality more than Closure-in-Place, but the latter would still have positive benefits. Please also see response to Comments 10-13.
16	Kendra Abkowitz	TDEC	TVA should also address in more detail (such as equipment, approach, potential environmental impact, management of removed liquids, etc.) its approach for removal of free liquids and/or stabilization of the CCR material.	TVA will require its selected contractor to provide a detailed treatment plan for any free liquids removed from the regraded material. This would likely involve a temporary treatment system that would include a series of tanks to ensure treatment to a level to satisfy the requirements of NPDES Outfall 001. Please also see response to Comments 10-13.
17	Kendra Abkowitz	TDEC	A field investigation is recommended for CCR material characteristics in the Main Ash Pond prior to the speculation that it is similar to the CCR material removed from the Stilling Pond.	A detailed investigation is currently underway as part of the TDEC Commissioner's Order. Part of this investigation includes Material Characterization. If additional information is requested by TDEC for this analysis, it will be obtained and provided to TDEC.
18	Kendra Abkowitz	TDEC	In Section 3.2.1.3 regarding Groundwater Quality on page 16, the adjacent industrial landfill facility (Industrial Landfill Permit # IDL 010000208) remains in biannual assessment monitoring. Continued Maximum Contaminant Level exceedances of Arsenic may require Owner/Operator to conduct an Assessment of Corrective Measures. TDEC recommends that TVA include this in the Final SEA.	TVA is in compliance with the TDEC Solid Waste permit (IDL #01-0208) through the Division of Solid Waste Management (DSWM) and submits reports including the results obtained from semi-annual groundwater monitoring. If TVA is requested by the DSWM to perform an Assessment of Corrective Measures, it will be conducted at that time.

No.	Name	Group	Comment	Response
19	Kendra Abkowitz	TDEC	TDEC recommends that any wastes associated with the proposed action or its alternatives be managed in accordance with the Solid and Hazardous Waste Rules and Regulations of the State of Tennessee. TDEC recommends that the Final SEA reference that any wastes that are generated during the construction process or uncovered during site preparation are subject to the Solid and Hazardous Waste Rules and Regulations of the State of Tennessee.	In consideration of the nature and scope of the proposed action, TVA determined that the potential impacts of the alternatives under consideration on the solid wastes are bounded by the prior PEIS (June 2016). As stated in the PEIS, TVA would manage all solid waste and hazardous wastes generated from construction activities in accordance with standard procedures for spill prevention and cleanup and waste management protocols in accordance with pertinent federal, state and local requirements.
20	Kendra Abkowitz	TDEC	TDEC is concerned with the stability and feasibility of constructing a PWB on top of the CCR materials in the Main Ash Impoundment. The SEA concludes that the CCR material needs to stay in place as it is difficult to de-water or move due to its fine particulate matter and stability characteristics; so, it will be closed in place and capped. Because TVA notes that de-watering and material stability are significant issues, TDEC recommends that TVA clarify in the Final SEA how, specifically, the CCR material will be de-watered in place, and, further, how the CCR material is stable enough for construction of a PWB on top of it. TDEC recommends that the Final SEA address these concerns in further detail.	Detailed design calculations show that adequate local and global stability factors of safety will be provided for conditions both during and after construction. This will be detailed in the Ash Management Plan to be submitted to TDEC. TVA will require its selected contractor to provide a detailed treatment plan for any free liquids removed from the regraded material. This would likely involve a temporary treatment system that would include a series of tanks to ensure treatment to a level to satisfy the discharge requirements of NPDES Outfall 001. Concerning stability, this dewatering scheme would allow for local dewatering and possibly amendment of the working surface to increase local stability.
21	Kendra Abkowitz	TDEC	TDEC also recommends TVA further explain in the Final SEA how the interim measure PWB on top of the Main Ash Impoundment could feasibly be removed. Further, TDEC is concerned that once the 13-acre interim PWB is built on top of the Main Ash Impoundment it will be difficult for the PWB to be anything but a permanent measure, not an interim one.	PWB 2 is not intended to be a permanent structure and will be constructed as such. The interim measure will consist of interim cover materials such as clay, soil, geosynthetics, etc., that could be excavated or removed and either stockpiled for reuse or disposed of. TVA understands that the TDEC Commissioner's Order is still in progress and permanent conditions at the site will be determined at a later time. In the interim, however, TVA must cease flows into the CCR unit and continue to manage non-CCR water in compliance with the site's NPDES permit.

No.	Name	Group	Comment	Response
22	Kendra Abkowitz	TDEC	TDEC concurs with TVA that a Construction Stormwater Permit and accompanying Stormwater Pollution Prevention Plan will be required since the project will involve the disturbance of more than one acre of land. The existing NPDES permit may need to be modified based on the change in discharge waters. There may also be a need to update the General NPDES Stormwater Multi-Sector General Permit for Industrial Activities. TDEC recommends that the potential for NPDES permit modification be considered in the Final SEA.	The current NPDES permit was issued with Tier 1 and Tier 2 limits effective for before and after main ash impoundment closure, respectively. TVA will design and construct the Process Water Basins to ensure compliance with the NPDES permit Tier 2 limits. As required by the narrative condition in Part I.A of the NPDES permit, TVA will notify the Division at least 10 days in advance of the Process Water Basin becoming operational after ash impoundment closure. Since all stormwater from the closed or converted main ash impoundment footprint will be discharged through NPDES Outfall 001, TVA does not anticipate a need to construct new TMSP storm water outfalls as part of the main ash impoundment closure efforts.
23	Larry Gissentanna	U.S. EPA Region 4	The EPA requests that TVA adhere to the list of required permits or licenses and best management practices necessary for the implementation of TVA's proposed action to reduce risk to surface water during construction-related impacts.	Thank you for your comment. TVA will adhere to all BMPs and mitigative measures as required to reduce or avoid adverse effects. In addition, best management practices would be used throughout the project to minimize erosion, prevent spills, reduce noise, and further reduce potential impacts on environmental resources.
24	John Fox	Trinity Environmental Resources	Encouraging the use of Plasma Arc Technology to eliminate coal ash ponds in place.	TVA appreciates your information and will forward this to the engineering team for review.
25	Tracy Wandell	Anderson County Board of Commissioners	Since TVA has made the choice to close BRF we respectfully request that the property be returned back to its natural state as best as possible. We as a Community oppose any ash storage onsite in any capacity. Closing the plant and then storing coal ash onsite in lined or unlined storage areas is not acceptable for the future development of this 1,000-acre parcel. We respectfully request meetings with TVA to fully understand how TVA will work towards removing the ash and the structures. We would also like to understand how TVA will work with Anderson County to develop future site plans and suggestions for the future development of this parcel.	TVA is conducting an extensive environmental investigation, under the direction of TDEC, into the potential impacts of CCR at Bull Run. The results of that investigation will help guide decisions on the future of the CCR at Bull Run, including the decision for closure in place; closure by removal to a new, lined landfill onsite; or closure by removal to a landfill offsite. As a federal agency, TVA follows a process in the National Environmental Policy Act, which includes public input, for all major actions, including the future of the Bull Run plant and CCR storage there. TVA understands the interest in the future of the Bull Run property. Our goal is the same as the community's – to implement the most appropriate solution and to work together on the potential redevelopment of the site.

No.	Name	Group	Comment	Response
26	Jonathan Levenshus	Sierra Club	Please find attached a spreadsheet of the 97 comments collected by the Sierra Club's Tennessee Chapter on the draft SEA for the Bull Run Ash Impoundment project. Here is the petition the members signed on to: *I want to express my support for moving coal ash waste at the Bull Run coal plant to dry, lined storage away from waterways and people's homes. TVA's most recent proposal for storing coal ash waste at the Bull Run coal plant is not suitable for protecting the public's health and environment. I am particularly concerned that coal ash toxins would continue to contaminate local water supplies and the rivers and lakes that are used for fishing and recreation by thousands of people each year. I urge you to write a plan that cleans up the coal ash waste at the Bull Run coal plant by requiring the waste to be moved to areas safely away from our homes, waterways and drinking water supplies.*	Thank you for your comments. Although TVA continues to gather additional data under the CCR Rule and the TDEC Commissioner's Order, a significant amount of data already exists, and none of it indicates that the CCR at Bull Run is contaminating drinking water or that the constituents within the CCR at Bull Run are migrating offsite at harmful levels. Since 1991, TVA has conducted long-term water quality and aquatic community monitoring of its reservoirs, including Melton Hill. With few exceptions, unrelated to TVA's operation of BRF, the water quality supports TDEC-designated uses of Melton Hill for Water Supply, Fish & Aquatic Life, Recreation, Livestock Watering & Wildlife, Irrigation & Navigation. In 2017, TVA conducted aquatic community assessments upstream and downstream of BRF to determine the status of the aquatic community. The results of these assessments demonstrated that comparable balanced, indigenous fish communities were being supported in Melton Hill upstream and downstream of BRF. Under the preferred alternative the Main Ash Impoundment would be Closed-in-Place with and interim cover and a portion (approximately 13 acres) would be repurposed for use as an interim process water basin (Interim PWB2). The Stilling Pond would be Closed-by-Removal and would also be repurposed for use as a process water basin (PWB1). The preferred alternative is an interim solution until a permanent decision is made through the TDEC Commissioner's Order process. This interim strategy was chosen to avoid potential impacts associated with constructability/timing/safety and potential environmental compliance hazards. Further, the dewatering and subsequent lack of rainfall infiltration into the CCR materials in the impoundment would provide an immediate reduction in the risk of migration of constituents to groundwater. Repurposing of the southern portion of the Main Ash Impoundment and the Stilling Pond

No.	Name	Group	Comment	Response
				would entail installation of an approved low permeability liner that would isolate surface water above the liner and prevent groundwater contact. Operation of the proposed repurposed PWB system is expected to maintain or improve the quality of water that would be discharged. Additionally, wastewater would be managed and treated in lined basin(s), thus eliminating any potential underseepage. Furthermore, mitigative measures would be introduced to ensure that discharge waters comply with NPDES permit limits and TDEC water quality criteria. Additionally, as stated in Section 3.2.2 of the SEA, TVA would implement any supplemental mitigation measures required pursuant to the Commissioner's 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. Consequently, as previously described in Part II of the PEIS, proposed impacts to groundwater from in-place closure of a portion of the Main Ash Impoundment and repurposing of a portion of the Main Ash Impoundment and the Stilling Pond are expected to be beneficial. TVA conducted a thorough analysis of potential impacts to environmental resources and factors in the PEIS (June 2016) including air quality, wetlands, vegetation, wildlife, threatened and endangered species, recreation, groundwater, drinking water, visual settings, and human health, flora and fauna. The analyses indicated that closure of CCR impoundments would not have a significant impact on these resources. As noted in Chapter 1.6 of the SEA, the impacts of closure of the Main Ash Impoundment and Stilling Pond is bounded by the analysis in the PEIS. In response to individual comments regarding the use of existing rail facilities to transport CCR from the Main Ash Impoundment and Stilling Pond, TVA agrees that existing rail facilities are located at BRF; however, these facilities are not configured and designed to support loading and transport of CCR and as such rail facilities would

No.	Name	Group	Comment	Response
				have to be expanded and improved at most facilities to support CCR loading and unloading operations. Additionally, as noted in the PEIS, rail cars dedicated for use as CCR transport would also have to be acquired to support CCR removal. The expansion of rail facilities could result in additional environmental impacts in the vicinity of BRF as well as additional cost to TVA.
	Kimberly Heath	Sierra Club Petition	I live within a few miles of the plant and I want my neighbors there to be safe! Thank you!	Thank you for your individual comment. Please see response to Comment 27.
	Ron Shrieves	Sierra Club Petition	It's high time for TVA to be PROACTIVE in ensuring the health and safety of its customers and employees!	Thank you for your individual comment. Please see response to Comment 27.
	Susan Hathcock	Sierra Club Petition	This entire situation has been a travesty.	Thank you for your individual comment. Please see response to Comment 27.
	Michael Pardee	Sierra Club Petition	This problem has gone on far too long, with lame excuses and finger pointing when it is clear that reasonable safety measures were not employed. Inexcusable.	Thank you for your individual comment. Please see response to Comment 27.
	Scott Sheaffer	Sierra Club Petition	Stop poisoning the air and the water.	Thank you for your individual comment. Please see response to Comment 27.
	Claire Meggs	Sierra Club Petition	Would you want your friends and family to live near the Bull Run plant? Or drink the water or eat the fish???????	Thank you for your individual comment. Please see response to Comment 27.
	Linda Myers	Sierra Club Petition	We are running out of time to clean up our environment before we do irreparable harm to it and thus to humanity itself. Maybe it's already too late. If everyone takes responsibility, including businesses and corporations, as well as individuals, maybe we can still reverse or at least halt and mitigate the harm we have done. Please, please do the right thing here...remove the coal ash to safe, protected storage, where it cannot endanger any water	Thank you for your individual comment. Please see response to Comment 27.

No.	Name	Group	Comment	Response
			sources or communities. Thank you for considering this plea. We are trusting you to do the right thing and act to protect us and the environment we live in.	
	Connie Whitson-Forbes	Sierra Club Petition	I live near the Kingston Plant. Three smoke stack changes in 22 years. Now the "cleaner scrubber" stacks send something in the air to the northeast where I live and it is cloudy here and sunny in other areas?? The Kingston ash spill is still bring felt especially among the workers cleaning it up and told they didn't need protection..three words....GREEN NEW DEAL	Thank you for your individual comment. Please see response to Comment 27.
	Joel Fairstein	Sierra Club Petition	Please clean up the coal ash mess.	Thank you for your individual comment. Please see response to Comment 27.
	Allison Wolf	Sierra Club Petition	I live walking distance from the Bull Run plant. We have the wetlands from Haw Ridge and the greenway directly across the river from the plant and the area just downstream of it is a haven for wildlife. No community should have to go through the sort of thing that happened in Kingston, and I worry about what would happen to the people on shore in Solway in addition to being worried about the park and the wildlife there. Please work towards the most responsible storage possible for this toxic material.	Thank you for your individual comment. Please see response to Comment 27.
	James Groton	Sierra Club Petition	TVA needs to clean up its mess at Bull Run, including the ash ponds.	Thank you for your individual comment. Please see response to Comment 27.
	Mac Post	Sierra Club Petition	I live nearby and want the community to be free from the effects of coal ash on our land, water, and air.	Thank you for your individual comment. Please see response to Comment 27.
	Stacy Jollay	Sierra Club Petition	My child has already beat brain cancer. We do not want this nasty stuff near our home!	Thank you for your individual comment. Please see response to Comment 27.

No.	Name	Group	Comment	Response
	Lloyd Jollay	Sierra Club Petition	My wife is going crazy with worry over this mess! We both have environmental backgrounds. My in-laws live near Kingston Steam Plant. We are educated and well-aware of how nasty this stuff is! Please do not do this.	Thank you for your individual comment. Please see response to Comment 27.
	Ellie Jollay	Sierra Club Petition	I have already fought and beat cancer. The treatment I had makes me more susceptible to getting another form of cancer. Please protect me from the environment that I live in. Please keep this toxic ash out is my groundwater, air, and community.	Thank you for your individual comment. Please see response to Comment 27.
	William Williams	Sierra Club Petition	As a toddler my family lived in the Swan Pond Community near the Kingston plant (later inundated by the coal ash impoundment spill). I now live in Clinton and want the Bull Run coal ash to go out to dry, lined storage as stated above. TVA could do this now cost-effectively using the current coal trains now leaving empty. I would also like to see the gypsum made available to be used to improve clay-based soils throughout the SE. (In the Copper Basin remediation lime was dropped by helicopters!)	Thank you for your individual comment. Please see response to Comment 27.
	Megan Cook	Sierra Club Petition	I live within three miles of this facility and very near Melton Lake. I would love to be able to enjoy the lake and the surrounding area with my young children for years to come without having to worry about toxic water. Please move the coal ash to a place where it will not threaten the lives of the people in the surrounding communities.	Thank you for your individual comment. Please see response to Comment 27.
	Lara Miller	Sierra Club Petition	We don't need another Kingston coal ash spill.	Thank you for your individual comment. We take your concerns seriously and have monitoring programs in place to ensure the safety and stability of the impoundments at BRF.
	Barbara Kelly	Sierra Club Petition	I'm especially concerned about the young children growing up in the community, who will be exposed to these toxins just playing in their yards and playgrounds! Coal ash does not belong anywhere other than dry, lined storage! Adopt a safe plan now, even if it costs us more money.	Thank you for your individual comment. Please see response to Comment 27.

No.	Name	Group	Comment	Response
	Robert Pyle	Sierra Club Petition	After the Kingston debacle, it must be clear how dangerous this coal ash is! Do the right thing, not the cheap thing, now.	Thank you for your individual comment. Please see response to Comment 27.
	Olivia Milloway	Sierra Club Petition	As a student studying environmental science and environmental health, I never thought I'd experience such a severe threat to my community's health and groundwater supply. I urge TVA to take precautions to prevent catastrophe like we've seen in the past and take every action to try to mitigate effects on east Tennessee vulnerable communities.	Thank you for your individual comment. Please see response to Comment 27.
	Ron Shrieves	Sierra Club Petition	As a member of the community, I would think that TVA would want to be proactive about health and safety issues. Their recent actions indicate that they feel that only the price of electricity matters. I think they will find that the recent adverse publicity will change the way the broader community assesses the performance of TVA. TVA is very short-sighted in its neglect of health and safety issues!	Thank you for your individual comment. Please see response to Comment 27.
	Chet Hunt	Sierra Club Petition	Do the right thing and be responsible for this tragedy.	Thank you for your individual comment. Please see response to Comment 27.
	Rebecca Bowman	Sierra Club Petition	The hazards of coal ash have been documented for generations. After the disaster in Kingston, we demand that TVA responsibly deal with the waste from Bull Run. We will hold TVA accountable for any damage done to our community.	Thank you for your individual comment. Please see response to Comment 27.
	David Bowman	Sierra Club Petition	I am concerned about how the storage of legacy waste from the Bull Run Power plant will affect public safety, property values, and public health in Oak Ridge. The record of TVA on storage of legacy coal ash waste is dismal. The waste should be stored in a dry form far away from waterways.	Thank you for your individual comment. Please see response to Comment 27.
	Susan Mahon	Sierra Club Petition	Please make sure that Bull Run doesn't end up with the coal ash issues that have plagued other coal plants in our area (such as in Kingston)!	Thank you for your individual comment. Please see response to Comment 27.

No.	Name	Group	Comment	Response
	Kelly Callison	Sierra Club Petition	Obviously moving all the coal ash would be very expensive so moving it into lined storage facilities might be the most practical solution.	Thank you for your individual comment. Please see response to Comment 27.
	Helen Jernigan	Sierra Club Petition	Dry, lined storage is essential and economically possible. The construction and placement of such containers could also provide jobs for local workers.	Thank you for your individual comment. Please see response to Comment 27.
	Jan Berry	Sierra Club Petition	Although Bull Run is slated for closure, TVA has expanded land available for coal ash disposal. This pristine land should never be used for disposal of any form of waste especially toxic coal ash. It is directly above a frequently used playground and is a blight on an otherwise beautiful recreation area. Haw Ridge and the Oak Ridge rowing facilities are visited by national and international tourists. Bull Run plant is a blight on Tennessee's beauty. The entire facility should be removed and TVA should encourage reuse to support the economic development of the Claxton Community.	Thank you for your individual comment. Please see response to Comment 27.
	Susan McGetrick	Sierra Club Petition	This is a beautiful place to live and we don't want it destroyed and polluted. We do not want our property values to go down due negligent practices in removing the TVA plant and coal ash toxins.	Thank you for your individual comment. Please see response to Comment 27.
	Gayle Greene	Sierra Club Petition	I'm very concerned about the water quality in Bull Run Creek.	Thank you for your individual comment. Please see response to Comment 27. In addition, as stated in the PEIS (June 2016), the impoundments at Bull Run Fossil Plant do not have any discharges to Bullrun Creek permitted under NPDES Permit TN0005410.
	Robert Slattery	Sierra Club Petition	As a nearby resident to the Bull Run plant, I am deeply concerned with any plan that leaves ash in unlined ponds. TVA's plans need to take into account future generations and demonstrate leadership as environmental stewards.	Thank you for your individual comment. Please see response to Comment 27.
	Marianne Murphey	Sierra Club Petition	Please act responsibly and move the coal ash waste to an area where it will not contaminate our neighborhoods or water!	Thank you for your individual comment. Please see response to Comment 27.

No.	Name	Group	Comment	Response
	Phoebe Wills	Sierra Club Petition	My home is directly across Melton Hill Lake from a Bull Run Ash Pond. I'm concerned for the safety of my family should TVA abandon these ponds.	Thank you for your individual comment. Please see response to Comment 27.
	Bryan Wills	Sierra Club Petition	A huge Bull Run Ash Pond sits across a small lake channel from my home. I want the fly ash moved to a dry, lined area away from Melton Hill Lake, Where there would be less danger to families, wildlife & aquatic life.	Thank you for your individual comment. Please see response to Comment 27.
	Andrea Wilson	Sierra Club Petition	It is important that we preserve the lakes and environment in general for future generations. Other states have out lawed this practice of storing coal ash. On windy days the ash flies through the air and settles on our homes and cars and nearby ground water has shown elevated levels of toxins. TVA is the steward of our waterways and must always put safety first so we can avoid another coal ash disaster in East Tennessee. Thank you for taking time to consider the health of our people and land when making future decisions on coal ash storage.	Thank you for your individual comment. Please see response to Comment 27.