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# JOHN SEVIER DAM MODIFICATION
# FINAL ENVIRONMENTAL ASSESSMENT
**Hawkins County, Tennessee**

**Prepared by:**
TENNESSEE VALLEY AUTHORITY
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September 2023

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# SYMBOLS, ACRONYMS, AND ABBREVIATIONS

| Acronym | Description |
|---|---|
| µm | Micron |
| AADT | Annual Average Daily Traffic |
| ac-ft | Acre-feet |
| ACS | American Community Survey |
| ADJ | Ash Disposal Area J |
| amsl | Above Mean Sea Level |
| AQCR | Air Quality Control Region |
| ARAP | Aquatic Resources Alteration Permit |
| BAP | Bottom Ash Pond |
| BG | Block Group |
| BMP | Best Management Practices |
| CAA | Clean Air Act |
| CCR | Coal Combustion Residuals |
| CEC | Categorical Exclusion Checklist |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| cfs | Cubic Feet per second |
| CGP | Construction General Permit |
| $CH_4$ | Methane |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| CT | Census Tract |
| CWA | Clean Water Act |
| cy | Cubic Yards |
| dB | Decibel |
| dBA | A-weighted Decibel |
| DCH | Designated Critical Habitat |
| DFAS | Dry Fly Ash Stack |
| EA | Environmental Assessment |
| EAR | Environmental Assessment Report |
| EIS | Environmental Impact Statement |
| EJ | Environmental Justice |
| EO | Executive Order |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| FONSI | Finding of No Significant Impact |
| FPPA | Farmland Protection Policy Act |
| ft | Feet/foot |
| GHG | Greenhouse Gas |
| HBA | Highway 70 Borrow Area |
| HEC-2 | U.S. Army Corps of Engineers Hydrologic Engineering Center, Computer program for water surface profiles |
| HRM | Holston River Mile |
| HUC | Hydrologic Unit Code |
| in/sec | Inches per Second |
| IPaC | Information for Planning and Consultation |
| JCC | John Sevier Combined Cycle Power Plant |
| JSF Dam | John Sevier Fossil Plant Detention Dam |
| Ldn | Day-night Sound Level |
| MBTA | Migratory Bird Treaty Act |
| MHGC | McDonald Hills Golf Course |
| MGD | Million Gallons per Day |

| **Acronym** | **Description** |
|---|---|
| mph | Miles per Hour |
| $N_2O$ | Nitrous Oxide |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NLCD | National Land Cover Database |
| $NO_x$ | Nitrogen Oxides |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Places |
| $O_3$ | Ozone |
| OSHA | Occupational Safety and Health Administration |
| Pb | Lead |
| PM | Particulate Matter |
| ppm | Parts per Million |
| PPV | Peak Particle Velocity |
| RCC | Roller-Compacted Concrete |
| RCRA | Resources Conservation and Recovery Act |
| RI | Remedial Investigation |
| RNHD | Regional Natural Heritage Database |
| SAIPE | Small Area Income and Poverty Estimates |
| SHPO | State Historic Preservation Officer |
| $SO_2$ | Sulfur Dioxide |
| SR | State Route |
| SWPPP | Stormwater Pollution Prevention Plan |
| TDAT | Tribal Directory Assessment Tool |
| TDEC | Tennessee Department of Environment and Conservation |
| TVA | Tennessee Valley Authority |
| TWRA | Tennessee Wildlife Resources Agency |
| USACE | U.S. Army Corps of Engineers |
| U.S.C. | U.S. Code |
| USCB | U.S. Census Bureau |
| USDA | U.S. Department of Agriculture |
| USDOI | U.S. Department of the Interior |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| USHUD | U.S. Department of Housing and Urban Development |
| VOC | Volatile Organic Compounds |
| VSQG | Very Small Quantity Generator |
| WOTUS | Waters of the United States |

# CHAPTER 1 – PURPOSE AND NEED FOR ACTION

## 1.1 Background

The Tennessee Valley Authority's (TVA) John Sevier Fossil Plant Detention Dam (John Sevier Dam or JSF Dam) is a run-of-river dam, located on the Holston River in Hawkins County, Tennessee, at the upstream end of Cherokee Reservoir (Figure 1.1-1). The Project Area overlaps the Cherokee Reservoir Reservation which includes the Cherokee Reservoir and land surrounding the reservoir in Jefferson, Grainger, Hamblen and Hawkins counties in East Tennessee. The Cherokee Reservoir is a popular recreation destination with campgrounds and hiking trails (TVA 2022a).

TVA constructed the JSF Dam in 1955 to provide cooling water for the then-adjacent John Sevier Fossil Plant (JSF Plant) which was located on the 750-acre John Sevier Reservation, south of the Holston River near Holston River Mile (HRM) 106 (U.S. Geological Survey [USGS] 1961). The JSF Plant was retired in 2014 and has since been deconstructed. The JSF Dam currently provides a reservoir of water for use at the nearby John Sevier Combined Cycle (JCC) Power Plant, as well as local boating and fishing opportunities.

The JSF Dam structure includes the following principle features: a 636-foot(ft)-wide, 25-ft tall concrete gravity overflow section that serves as the main spillway; a non-overflow section with a gated section (Decommissioned/Concrete Bulkhead); a 200-ft-long, 48-ft tall earthen embankment dam on the left (south) side of Cherokee Reservoir; and a 340-ft-long, 30-ft tall earthen embankment (armored with riprap and grout) on the right (north) side of Cherokee Reservoir. Currently, the right embankment at the JSF Dam is approximately 21 ft lower than the left embankment, 5 ft higher than the concrete overfall spillway, and is prone to overtopping. The entire dam is approximately 1,176 ft long with a maximum structural height of 48 ft. The key components of the existing JSF Dam are shown in Figure 1.1-2. The JSF Dam impounds a reservoir volume of approximately 305 acre-feet at elevation 1080 (TVA 2010a) with a surface area of 660 acres, storage capacity of 5,500 acre-feet (ac-ft), and an upstream drainage area of 3,006 square miles (National Inventory of Dams 2021). The intake canal for the JCC Plant/former JSF Plant is about 1,250 ft upstream of the dam on the left downstream facing bank and the discharge canal is about 400 ft downstream of the dam, also on the left downstream facing bank.

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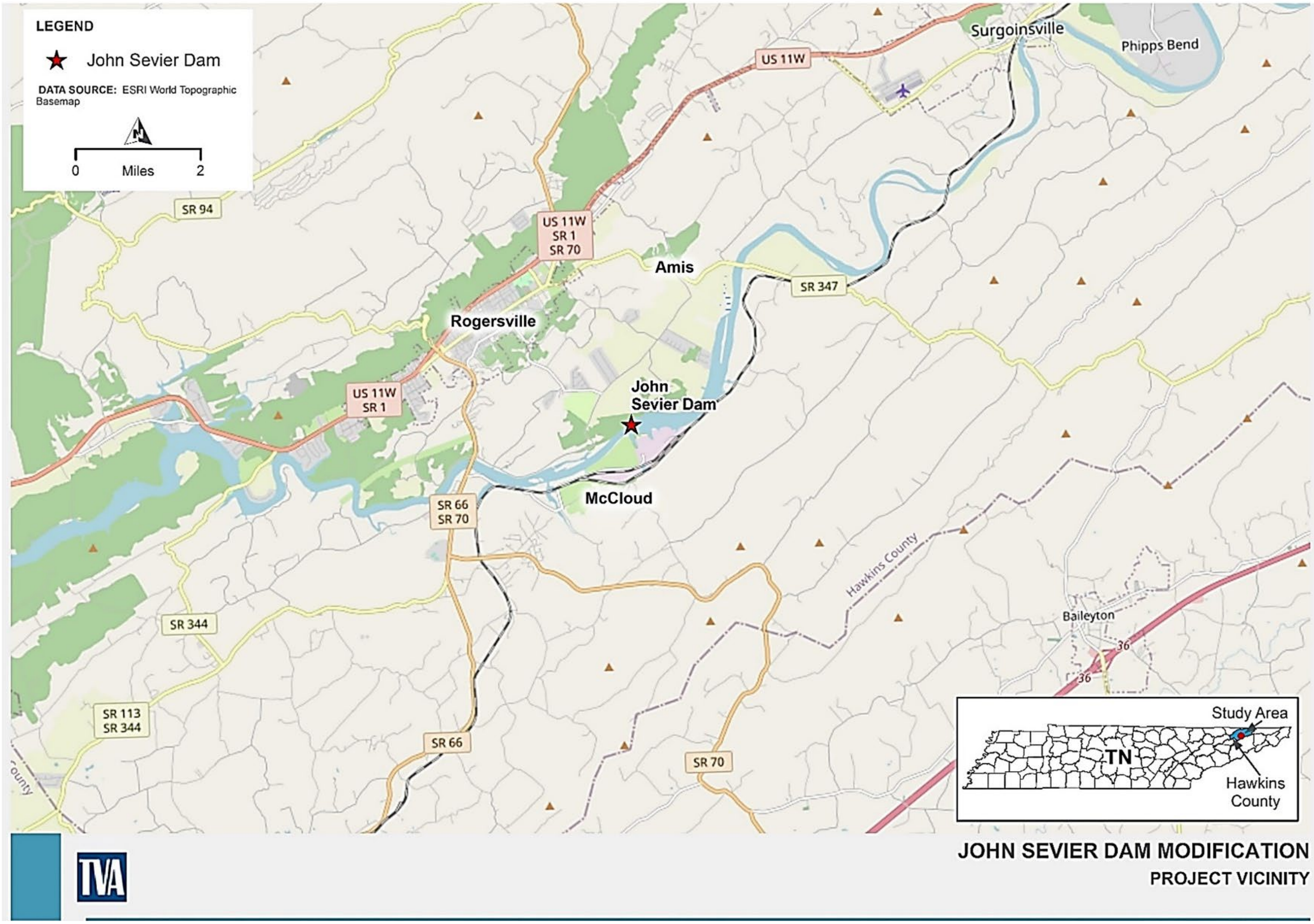


**Figure 1.1-1. Environmental Assessment Project Vicinity for the JSF Dam Modification**

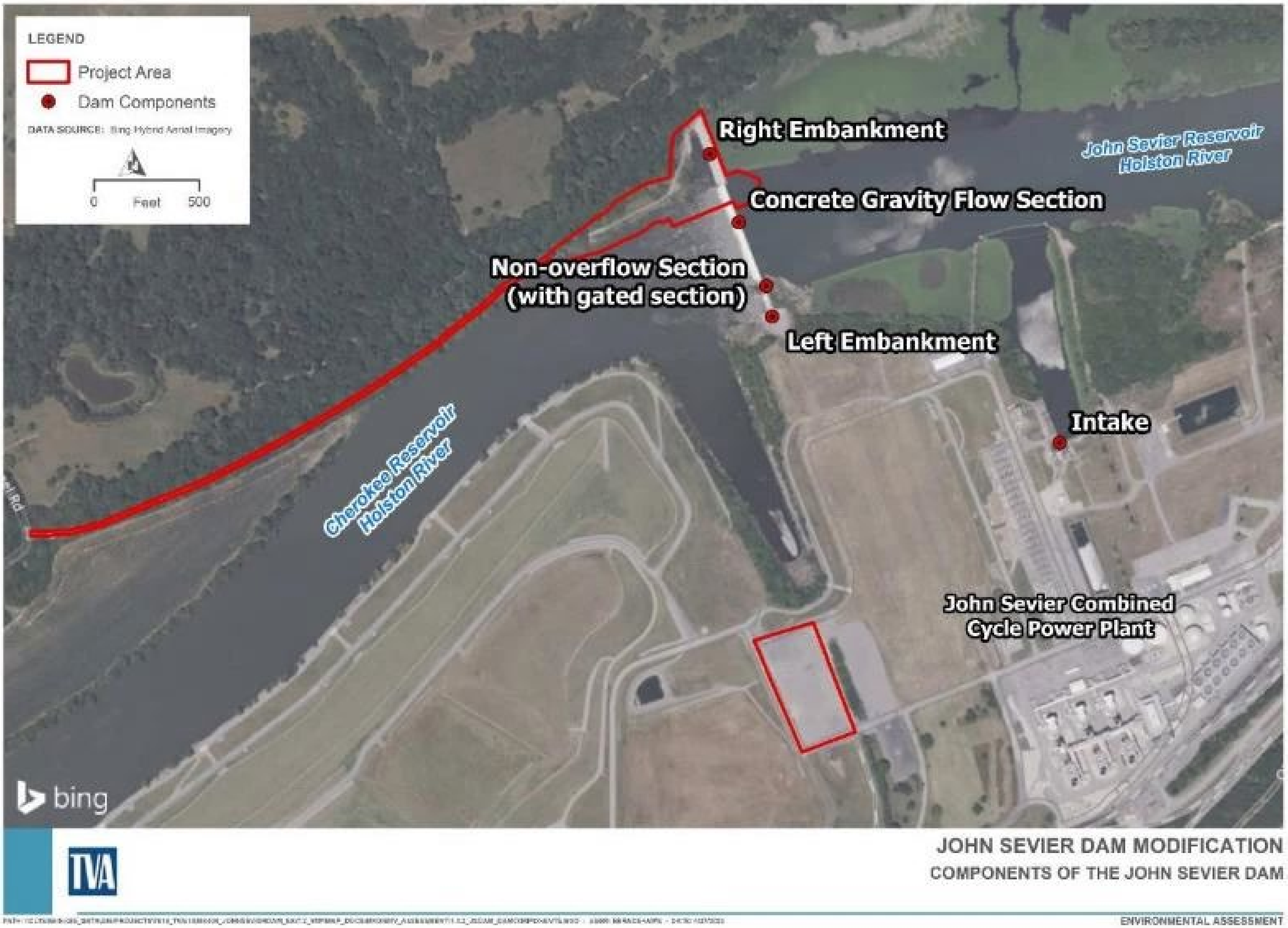


**Figure 1.1-2. JSF Dam Modification Project Area and Components**

A 2019 risk assessment for the JSF Dam indicates that under high river flows, water can overtop the right earthen embankment (crest at El. 1085 ft) and potentially lead to failure of the earthen embankment. To a lesser degree, the risk assessment also indicates the potential for internal erosion related failure of the right embankment under normal operating conditions due to concentrated leakage at the interface of the right embankment and rock abutment, concentrated leakage at the interface of the right embankment and concrete training wall, or backward erosion piping into karst features under the right embankment. While the JSF Dam has a history of overtopping during relatively routine flood events and has performed well to date during normal operating conditions, TVA considers the probabilities of an overtopping induced or internal erosion induced failure to be high enough that upgrades to the right embankment are warranted. Soon after completing the risk assessment, TVA implemented interim risk reduction measures to improve the resistance of the right embankment to potentially erosive overtopping flows until a permanent solution could be identified.

TVA completed a dam safety modification study which identified potential permanent options to address these potential failure modes that could result in dam failure. These two options, in addition to the No Action Alternative, are the three alternatives further described and evaluated in this Environmental Assessment (EA).

The potential migration of mercury-impacted sediment identified just upstream of the JSF Dam is a concern associated with potential dam failure. These mercury-impacted sediments were not caused by the operations of TVA but rather were caused by upstream operations of the Olin Corporation site in Saltville, Virginia. The U.S. Environmental Protection Agency (USEPA) provided comments related to the JSF Dam that are included in the 2015 TVA's Final EA for the JSF Plant Deconstruction (TVA 2015).

The Olin Corporation site, also known as the Saltville Waste Disposal Ponds site, which is located more than 100 miles upstream of the JSF Dam in Saltville, Virginia, is a Superfund site that includes the former Olin Corporation chlorine plant, two waste disposal ponds, and the North Fork Holston and Holston Rivers. On-site mercury contamination at the Olin Corporation site and over 80 miles downstream was identified in the late 1960s and the site was added to the Superfund program's National Priorities List in 1983 (USEPA 2023).

The USEPA Superfund Remedial Investigation (RI) of the Saltville Waste Disposal Ponds site detected elevated levels of mercury associated with the subsurface sediment just upstream of the JSF Dam. Based on a preliminary evaluation of results from the RI, USEPA stated that mercury in the subsurface sediment just upstream of the JSF Dam may present an unacceptable risk to human health and/or the environment if the JSF Dam is deconstructed and removed or if other activities disturb and/or mobilize the subsurface sediment (TVA 2015).

At the time of the 2015 Final EA (TVA 2015), USEPA had yet to complete the RI for sediment just upstream of the JSF Dam and other Holston River sediment (and the assessment of risk associated with this sediment), and no Superfund remedy had been selected for the subject sediments by USEPA in the event that a remedy would be determined to be necessary. The USEPA considered JSF Dam as an obstacle to further downstream migration of mercury-impacted sediment into Cherokee Reservoir downstream of the dam, based on comments filed during review of the JSF Plant Deconstruction Draft EA (TVA 2015). In addition, and based on the available information at the time, USEPA did not believe that the subsurface sediment presented a risk of concern as USEPA understood there were no plans at that time to deconstruct the dam or modify the dam in a manner that would mobilize the sediment of concern.

## 1.2 Purpose and Need

The purpose of the Proposed Action is to remediate the identified problems at JSF Dam including overtopping of the right embankment, concentrated leak erosion at the interface of the right embankment and the abutment or concrete training wall, and backwards erosion piping into karst features under the right embankment. TVA needs to remediate the identified problems at JSF Dam to ensure its safe continued operation.

## 1.3 Decision to be Made

This EA has been prepared to inform TVA decision makers and the public about the environmental consequences of the Proposed Action. TVA must decide whether to modify the JSF Dam, with modifications consisting either of riprap armoring of the right embankment or construction of a roller compacted concrete (RCC) gravity dam, or to take no action.

TVA will use this EA to support the decision-making process and to determine whether an environmental impact statement (EIS) should be prepared or whether a Finding of No Significant Impact (FONSI) may be issued.

## 1.4 Related Environmental Reviews

Environmental documents and materials were reviewed related to this assessment. These included environmental assessments and other reviews related to the nearby JCC Plant and former coal fired JSF Plant. These documents are incorporated by reference and are listed below.

- John Sevier Fossil Plant Addition of Gas-Fired Combustion Turbine/Combined-Cycle Generating Capacity and Associated Gas Pipeline Environmental Assessment (TVA 2010b). This EA describes the construction, operation, and permitting of the JCC Plant and the environmental setting of the John Sevier Reservation.
- John Sevier Fossil Plant Intake Debris Removal Environmental Assessment (TVA 2005). This EA established protocols for future routine maintenance necessary to maintain the raw water intake structure for the JSF and JCC facilities.
- John Sevier Fossil Plant Deconstruction Final Environmental Assessment (TVA 2015). This EA evaluates the impacts associated with the proposed demolition of the JSF Plant.
- TVA Categorical Exclusion Checklists (CEC), CEC ID 42157-John Sevier Dam Emergency Repair CEC (TVA 2020). This CEC describes the proposed action to repair the dam by adding a 6-inch-thick layer of concrete or slush grout over the existing armoring to the downstream slope of the dam.
- TVA CEC, CEC ID 48670 – John Sevier Geotechnical Field Investigation (TVA 2022). This CEC describes the proposed action to conduct geotechnical investigations in support of design efforts for the modification of the right embankment of the JSF Dam.

The description of the affected environment and the assessment of impacts contained in the documents listed above were used in support of this analysis, and are incorporated, as appropriate, into analyses for each environmental resource in Chapter 3.

## 1.5 Scope of the Environmental Assessment

TVA has prepared this EA to comply with National Environmental Policy Act (NEPA) and associated implementing regulations. TVA considered the possible environmental effects of the proposed action and determined that potential effects to the environmental resources listed below were relevant to the decision to be made. Thus, potential effects to the following environmental resources are addressed in detail in this EA:

- Land Use
- Geology, Soils, and Prime Farmland
- Groundwater
- Surface Water and Water Quality
- Floodplains
- Wetlands
- Vegetation
- Wildlife
- Aquatic Ecology
- Threatened and Endangered Species
- Natural Areas, Parks, and Recreation
- 
- Air Quality
- Greenhouse Gases and Climate Change
- Noise and Vibration
- Transportation
- Navigation
- Cultural Resources
- Visual Resources
- Solid and Hazardous Waste
- Utilities and Service Systems
- Socioeconomics and Environmental Justice
- Safety

## 1.6 Public and Agency Involvement

TVA's public and agency involvement included posting on TVA's website (http://tva.com/nepa) the Draft EA and a notice of availability and a 30-day public review of the Draft EA. The availability of the Draft EA was announced in newspapers that serve the Hawkins County, Tennessee, area (including the Rogersville Review and the Citizen Tribune). TVA's agency involvement includes circulation of the Draft EA to local, state, and federal agencies and federally recognized tribes, as part of the review. Comments on the Draft EA were accepted from May 30 through June 30, 2023, via TVA's website, mail, and e-mail.

TVA received a total of 13 comments from nine commentors with approximately 27.3 percent of comments in support of Action Alternative C (Roller-Compacted Concrete, as described in Section 2.1.3 of the Final EA) and another 27.3 percent supportive of Alternative A, the No Action Alternative. The remaining comments were a mix of questions, agency comments, or recommendations to TVA, a portion of which were specific to the JSF project. Most of the comments were submitted through the web-based comment form. One comment received was regarding improvements to fish passage and is outside the scope of the draft EA and is not discussed further in this report. Appendix A contains the comments received on the draft EA and TVA's responses to the comments. This EA has been revised, where appropriate, in response to the comments received.

## 1.7 Necessary Permits

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

- Tennessee General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Storm water associated with construction activities
- Tennessee Department of Environment and Conservation (TDEC) Individual Aquatic Resource Alteration Permit (ARAP) Section 401 Water Quality Certification
- U.S. Army Corps of Engineers (USACE) Nationwide 3 Maintenance permit
- TDEC Class V Underground Injection Control Permit
- Non-Title V Concrete Batch Plant Source Permit

Information regarding the above permits or coordination is provided in Appendix B. In addition to the permits listed above, the project would fall under an existing Integrated Pollution Prevention Plan. TVA would obtain any solid or hazardous waste permits that may be required. TVA would be responsible for ensuring necessary permits are obtained and implemented, manifests completed, and hazardous waste disposal properly reported. TVA would comply with permit mitigation requirements.

# CHAPTER 2 – ALTERNATIVES

Descriptions of the action alternatives, the no action alternative, a brief comparison of their environmental effects, and TVA's preferred alternative are presented in this chapter.

## 2.1 Description of Alternatives

TVA has determined that there are two action alternatives to meet the purpose and need defined in Chapter 1. The two action alternatives and a No Action Alternative are evaluated in this EA and are described below.

### 2.1.1 Alternative A – The No Action Alternative

Under the No Action Alternative, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Currently, the right embankment at the JSF Dam is approximately 21 ft lower than the left embankment, is approximately 5 ft higher than the concrete overfall spillway, and is prone to overtopping. Periodic maintenance would include potentially large emergency repairs of overtopping protection immediately following overtopping events. Emergency repairs would likely include adding concrete grout and riprap to the downstream face of the right embankment and re-establishing the right embankment crest to current design width and elevation.

Specific repair and maintenance activities would require separate environmental review under NEPA. For comparison to the proposed action alternatives, it is assumed periodic maintenance could require, but would not necessarily be limited to, temporary land disturbance adjacent to the dam to allow for operation of construction equipment, excavation, and use of a temporary cofferdam or work pad for in-water work. As the JSF dam would be maintained in its current configuration, impacts associated with periodic maintenance activities would likely be temporary. Following maintenance, the workspace would be restored to pre-construction conditions to the extent practicable. Existing land uses in the immediate project would likely remain industrial and rural.

This alternative would not address the risks identified in the 2019 JSF Dam risk assessment. Without modifications the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows. The dam would also be at an increased risk of moderate effects from internal erosion or internal erosion-related failure of the right embankment from one or more of the following sources:

- Concentrated leakage at the interface of the right embankment and rock abutment under normal operating conditions.
- Concentrated leakage at the interface of the right embankment and concrete training wall under normal operating conditions.
- Backward erosion piping into karst features below the right embankment under normal operating conditions.

### 2.1.2 Alternative B – Additional Riprap Armoring

Under Alternative B, additional riprap armoring would be added to the existing right embankment of the dam to act as a rockfill spillway. Within the 10.2-acre combined Alternative B footprint, illustrated in Figure 1.1-2, the proposed work area includes approximately 1.2 acres for the support/laydown area, about 2.5 acres for the construction zone (including temporary placement of a 0.4-acre coffer dam, permanent placement of 1.5 acres for the rock riprap structure, and 0.6-acre of workspace), an existing 1.4-acre access road, 1.0 acre of riprap placement for shoreline stabilization, 0.4 acre for a temporary debris boom, and a 3.7-acre area to include a temporary laydown area for a construction office and material storage (as illustrated in Figure 2.1-1). Riprap would be placed at a 10:1 (horizontal: vertical) slope over the existing 2:1 slope riprap embankment. The proposed slope and riprap armoring are designed for six ft of overtopping, which corresponds to a 500-year flood event.

The 10:1 slope would allow for the use of smaller size riprap in comparison to a 2:1 slope and would extend the embankment approximately 195 ft further downstream of the current embankment.

The riverbank downstream of the rebuilt dam embankment would be armored with riprap for a length of approximately 300 ft for erosion protection and to direct flow into the downstream channel. The rockfill spillway would tie into the existing rip rap armoring on the downstream bank where existing rip rap armoring would be refreshed and replaced for up to approximately 750 ft further downstream to prevent future erosion of the bank and undercutting of the access road. The existing concrete right training wall on the left side of the rebuilt embankment would be extended in the downstream direction. Figure 2.1-1 provides the proposed construction layout for the Project Area. Figure 2.1-2, Figure 2.1-3, and Figure 2.1-4 illustrate this concept.

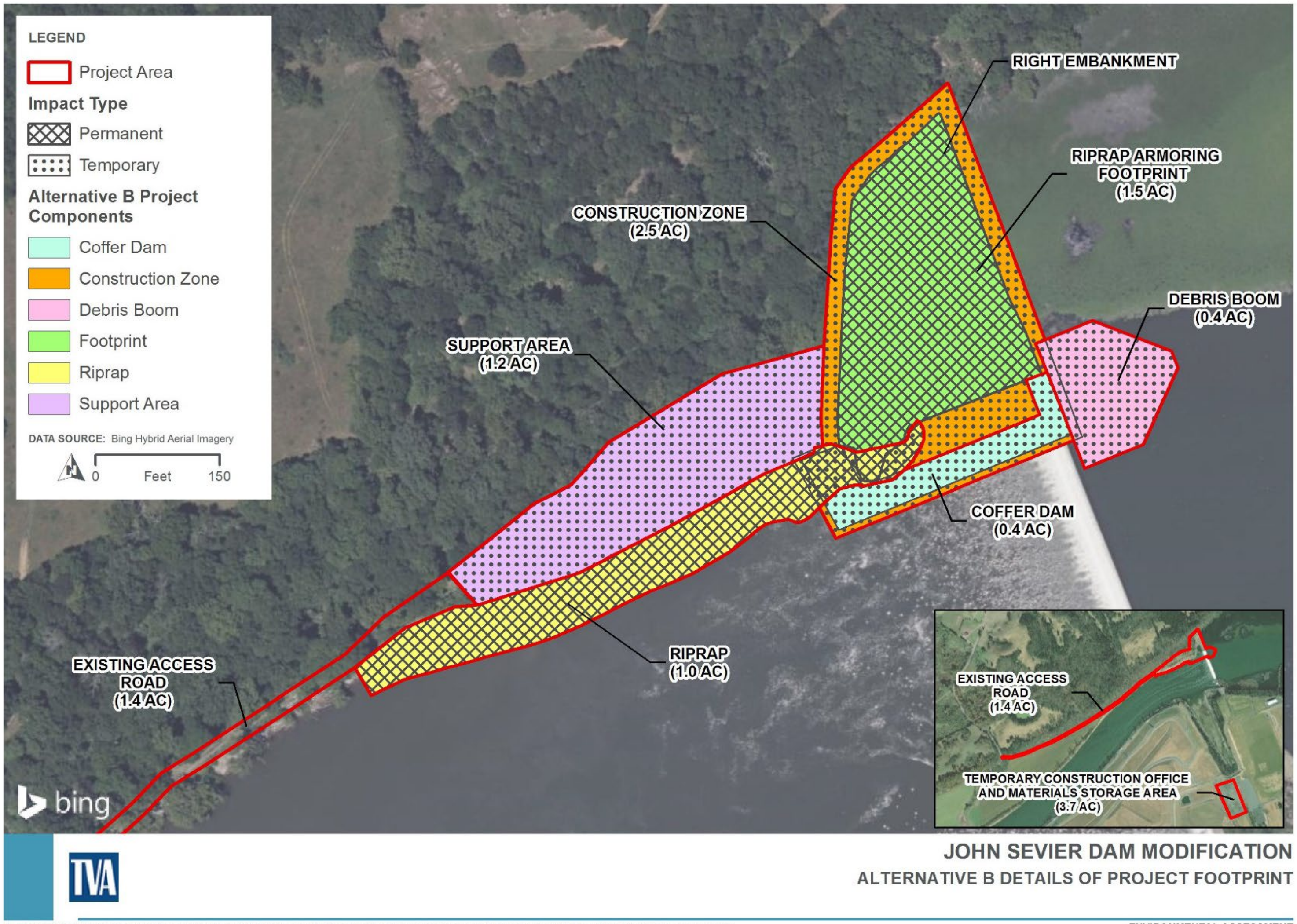


**Figure 2.1-1. Proposed Alternative B Project Footprints for the JSF Dam Modification Project**

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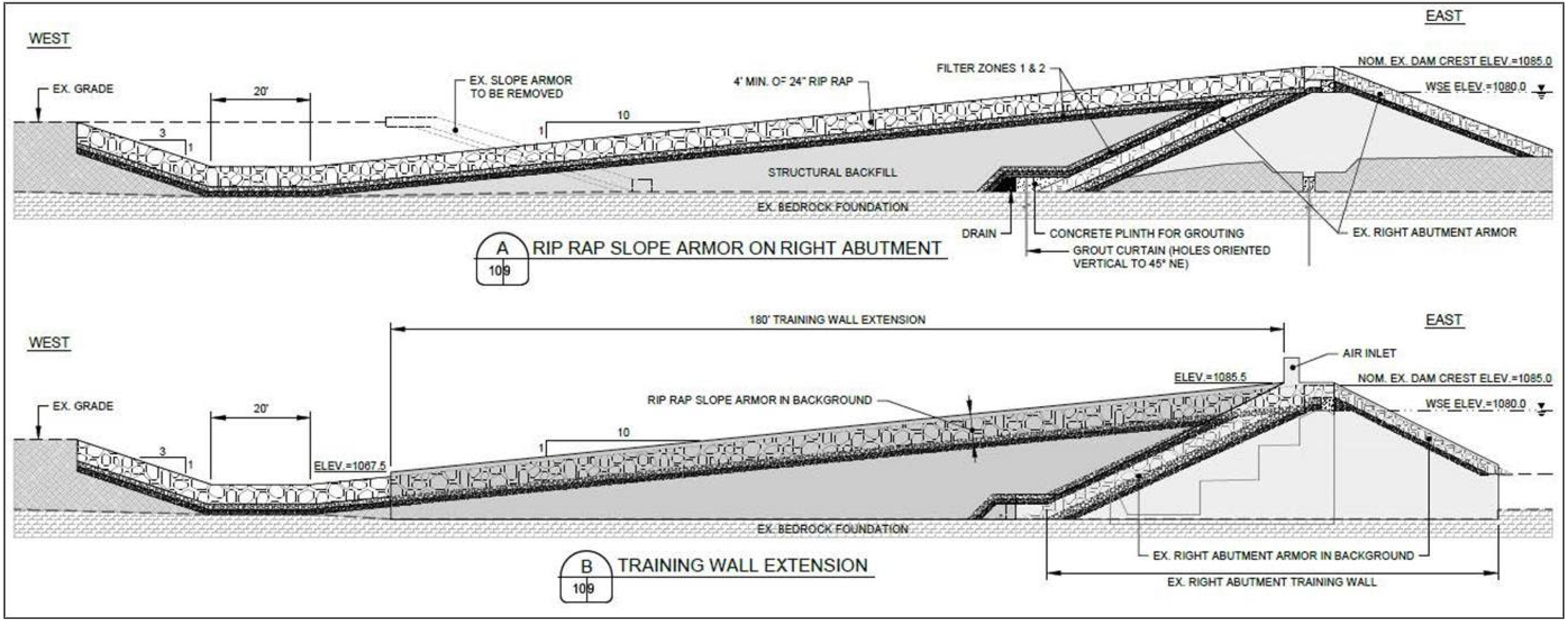


**Figure 2.1-2. Details of the Alternative B Rockfill Spillway on the Downstream Side of the Right Embankment of JSF Dam**

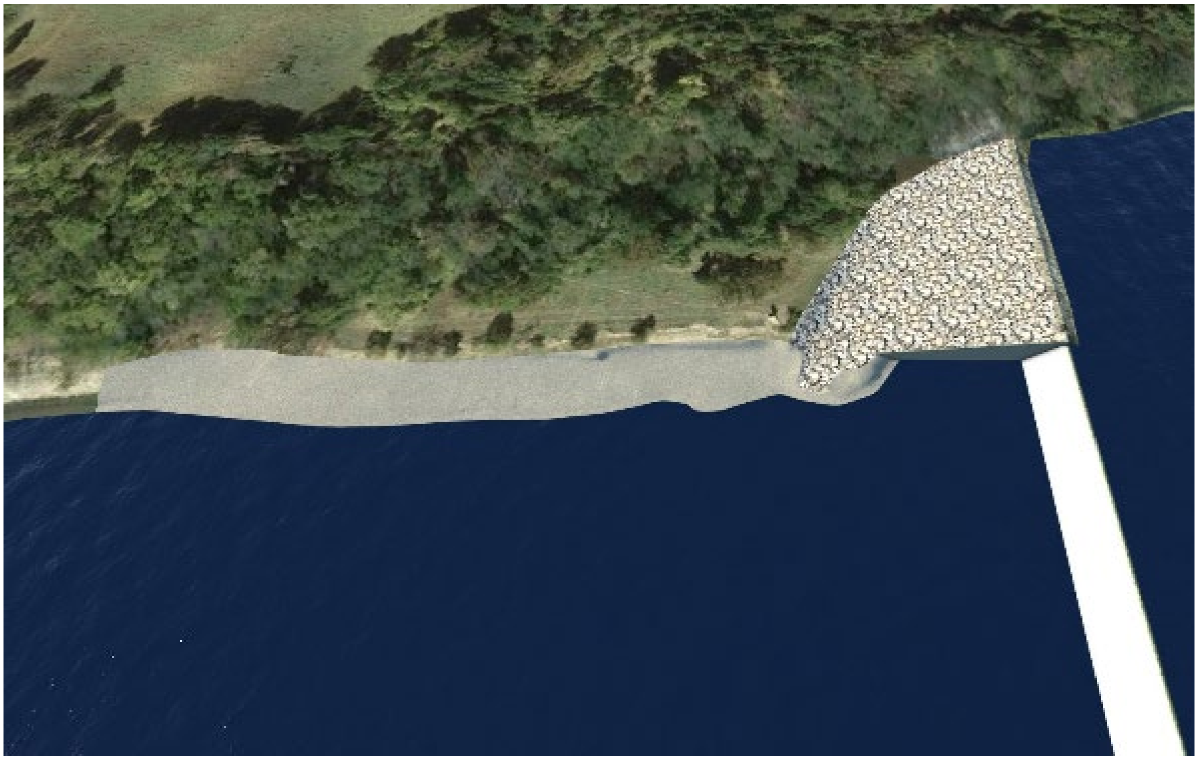

**Figure 2.1-3. Alternative B perspective looking from the Cherokee Reservoir at the right abutment of JSF Dam**

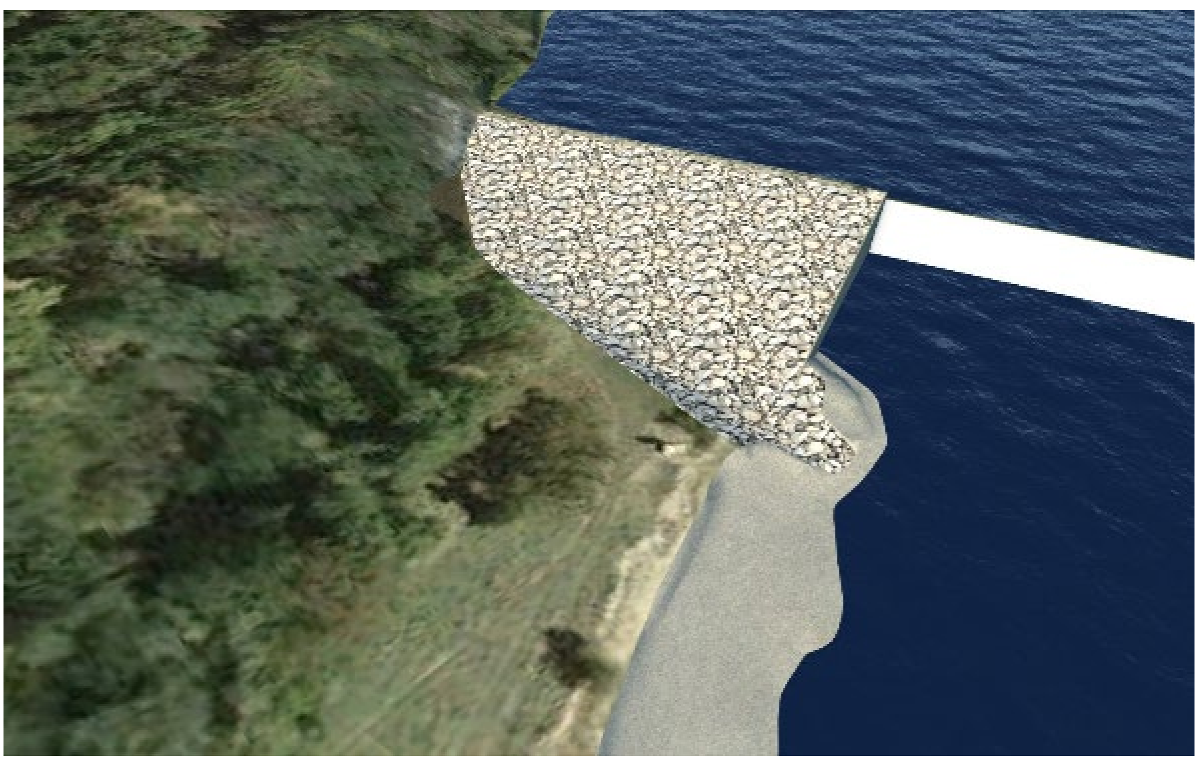

**Figure 2.1-4. Alternative B perspective downstream of JSF Dam, facing upstream**

#### 2.1.2.1 Site Mobilization & Environmental Controls

A temporary construction office and material storage area, approximately 3.7 acres, would be established at an existing gravel lot on the JSF Reservation south of JSF Dam. The right embankment would be accessed using the existing one-lane gravel access road off McKinney Chapel Road as shown on Figure 2.1-1. The approximate 1.4-acre access road leads to a partially forested floodplain area downstream of the right embankment. This 1.2-acre forested floodplain would be used as the laydown area for construction and tree removal would be required. The approximately 2,980-ft-long access road would be improved to facilitate equipment and materials delivery. Road improvements may include but are not necessarily limited to the addition of gravel/rock to reinforce the road for construction equipment and the addition of up to 1.5 acre-ft (2,500 cubic yards [cy]) of fill/rock riprap along the shoreline of the Cherokee Reservoir adjacent to stabilize the road where it appears the bank has eroded. Brush clearing or tree trimming would be required along the access road to allow for passage of equipment and bucket trucks. Improvements to the access road would be limited and are expected to have a negligible impact on flood elevations between the road improvements and the downstream face of the JSF Dam.

Best management practices (BMPs) for sediment and erosion control would be installed prior to commencing land disturbing activities in the Project Area. With the narrow access road and small laydown area, construction operations would be staggered. Construction related traffic is expected to require up to 75 truckloads per day for delivery of construction materials. The following schedule of work is recommended; these activities are described in further detail below:

- Water diversion and control
- Demolition
- Excavation and foundation preparation
- Grouting
- Training wall construction
- Rockfill spillway construction
- Demobilization and site stabilization

Construction activities would primarily occur during daylight hours for 5 days a week and would occur for approximately 7 to 8 months assuming 10-hour day shifts.

#### 2.1.2.2 Water Diversion and Control

The removal of water from the work area would be needed throughout construction. Since the right training wall would be extended downstream, a portion of the overflow spillway would need to be blocked from the spillway crest to downstream of the work area. A temporary cofferdam constructed of approximately 5,700 cy of granular material would be constructed as shown in Figure 2.1-2 and Figure 2.1-6. The granular material would be obtained from a local commercial quarry and hauled to the Project Area. After removal of the cofferdam, the granular material would be reused on-site, hauled to TVA-owned property for beneficial reuse at JCC, or disposed of off-site. A temporary flood barrier may also be needed on the existing dam crest to minimize overtopping of the dam during construction, as illustrated in Figure 2.1-6. Additionally, to limit the potential for debris impacts on this structure, a debris diversion floating boom would be placed directly upstream of the diversion structure to divert potential floating debris from impacting the diversion structure. The floating debris boom would be placed across three anchorage points made from temporary 24-inch nominal diameter (approximately) vertical spuds or submerged concrete blocks placed in a “V” pattern. The boom and temporary spuds would be removed following completion of the project.

Sumps, pits, and dewatering wells may also be needed to drain the work area from precipitation and groundwater infiltration. Dewatering silt bags would be employed to dry sediments; water from the dewatering bags would be discharged back into the Cherokee Reservoir.

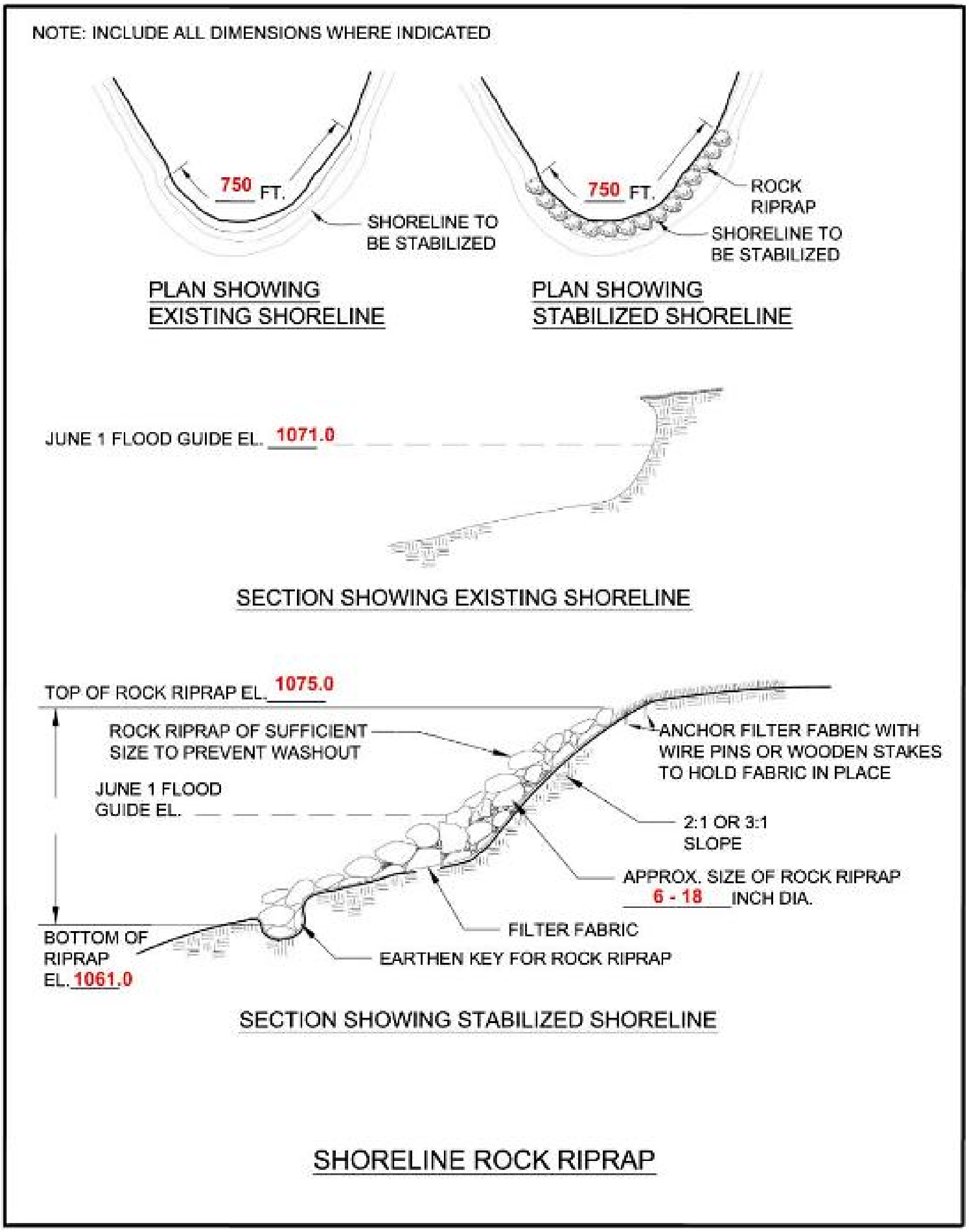


**Figure 2.1-5. Details of Shoreline Rock Riprap Stabilization along the Construction Support and Access Road Areas**


**Figure 2.1-6. General Illustration of Proposed Water Control and Diversion Measures and Excavation Areas for Alternative B of the JSF Dam Modification Project (aerial image from Bing Maps)**

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#### 2.1.2.3 Demolition

Once water control and diversion measures are installed, the existing downstream bank would be excavated to allow for the construction of the extended riprap spillway embankment. The existing riprap armoring on the downstream bank would be demolished and removed or salvaged for reuse. Additional demolition would be needed on the existing right embankment slope to break up the grouted riprap to construct the filter and drain materials prior to placement of the backfill material under the 10:1 sloped spillway.

#### 2.1.2.4 Excavation and Foundation Preparation

The downstream bank would be excavated approximately 100 ft downstream as shown in Figure 2.1-2 and Figure 2.1-6, totaling approximately 8,400 cy of soil excavation. This impacts the existing riverbank and would require the removal of trees and brush and the existing earthen and rock materials that form the riverbank. Excavated soils would be tested to verify they are not contaminated. Soils would be reused on-site, hauled to TVA-owned property for beneficial reuse at JCC, or disposed of off-site at an appropriate existing permitted landfill, depending on test results. The location of the off-site disposal would be determined based on sampling results. Disposal, beneficial use, and storage of soils would follow TVA procedures for soil placement and disposal. Portions of the abutment may need to be excavated to adequately shape the abutment for earthfill placement. Bedrock and loose rocks/gravel along the downstream toe between the dam and the excavation areas shown in Figure 2.1-2 may also need to be excavated to prepare the foundation for the modified structure. Foundation preparation would include the removal of rock ledges, infilling of joints and gouges with dental concrete, and cleaning of the rock surface for geologic mapping, grouting, and earthfill placement.

#### 2.1.2.5 Grouting

Grouting would be conducted from a concrete plinth at the toe of the existing dam, as illustrated in Figure 2.1-2. The grouting would address the potential for backward erosion piping into karst features under the right embankment and would be a single- or double-lined grout curtain located along the toe of the right embankment and into the right abutment and would consist of multiple holes drilled to a depth identified by the geotechnical and geological investigation. Contact grouting may also be required beneath the footprint of the entire rockfill spillway to close joints, bedding planes, and potential cavities in the bedrock foundation. The approximately 27,000 gallons of concrete-based grout would be produced in a batch plant located on the right bank (downstream-facing) construction laydown area from ingredients delivered by truck via the improved access road.

#### 2.1.2.6 Training Wall Construction

The training wall for Alternative B would extend from the existing training wall and run along the left side of the proposed rockfill spillway. As shown in Figure 2.1-2 and Figure 2.1-6, the extension of the wall would be around 180 ft long and made from conventional reinforced concrete. The new wall would tie into the existing training wall. Since the footing of the existing training walls cannot be modified, tiebacks into the new earthfill/rockfill spillway structure may be required to achieve adequate wall stability. Concrete would be batched offsite and hauled in conventional concrete trucks to the Project Area. Approximately 750 cy of concrete would be required.

#### 2.1.2.7 Rockfill Spillway Construction

After completion of excavation, preparation of the foundation, and completion of the lower portions of the training wall, the placement of earthfill for the new rockfill spillway would begin (see Figure 2.1-2). Earthfill and filter materials would be installed simultaneously in lifts. Approximately 8,000 cy of earthfill would be delivered by truck from an existing, permitted, off-site borrow source. Approximately 5,000 cy of filter materials, consisting of sand and fine aggregate would be delivered by truck from an existing, permitted, off-site quarry source. Riprap would be hauled in from an existing, permitted, off-site quarry source. The size of the riprap needed for the spillway is 2 ft (24 inches) in diameter and weighs around 1,400 pounds. Approximately 9,300 cy of the riprap material would be required, which would require up to 75 truckloads per day of material to be hauled to the Project Area.

#### 2.1.2.8 Demobilization and Site Stabilization

After completion of the spillway, all equipment and personnel would be demobilized from the Project Area. Except for the riprap bank stabilization adjacent to the access road, the areas disturbed during construction would be returned to pre-construction contours and stabilized with permanent vegetation. Temporary sediment and erosion control measures would be left in place until the Project Area becomes permanently stabilized. The combined duration of construction activities for Alternative B would be 7 to 8 months assuming 10-hour day shifts, Monday – Friday.

### 2.1.3 Alternative C – Roller-Compacted Concrete Gravity Dam

Under Alternative C, a roller-compacted concrete (RCC) gravity dam would be constructed on the downstream side of the existing right embankment dam. Within the 10.2-acre combined Alternative C footprint, illustrated in Figure 2.1-7, the proposed work area includes approximately 1.2 acres for the support/laydown area, about 2.5 acres for the construction zone (including temporary placement of a 0.4-acre coffer dam, permanent placement of 1.1-acre RCC gravity dam structure, and 1.0 acre of workspace), an existing 1.4-acre access road, 1.0 acre of riprap placement for shoreline stabilization, 0.4 acre for a temporary debris boom, and a 3.7-acre area to include a temporary laydown area for a construction office and material storage.

RCC is composed of the same materials as conventional concrete (cement, water, sand, crushed stone or gravel, and admixtures) but has a much drier consistency and can be transported by dump truck. It is typically applied in seamless layers that are spread with earth-moving equipment and compacted with heavy rollers. The RCC material would be transported to the site using up to 75 trucks per day.

The RCC gravity structure would have a vertical upstream face and approximately a 1:1 sloped downstream face. The left (southern) end of the RCC gravity structure would wrap around the training wall with the sloped face positioned south towards the JCC Plant. A stilling basin would be constructed by excavating to bedrock immediately downstream of the RCC gravity structure and the riverbank downstream of the stilling basin would be armored with RCC that would tie into the existing riprap armoring. The existing riprap armoring may be extended up to approximately 750 ft further along the downstream bank to prevent future erosion of the bank and undercutting of the access road and/or downstream bank RCC slope armoring. Additional riprap, RCC, grout, or conventional concrete may be required in the stilling basin to prevent future degradation of the rock abutment or bedrock during overtopping events. Water flowing over the spillway would be directed into the stilling basin at the bottom of the gravity dam and towards the downstream channel. Figure 2.1-8, Figure 2.1-9, and Figure 2.1-10 illustrate this concept.

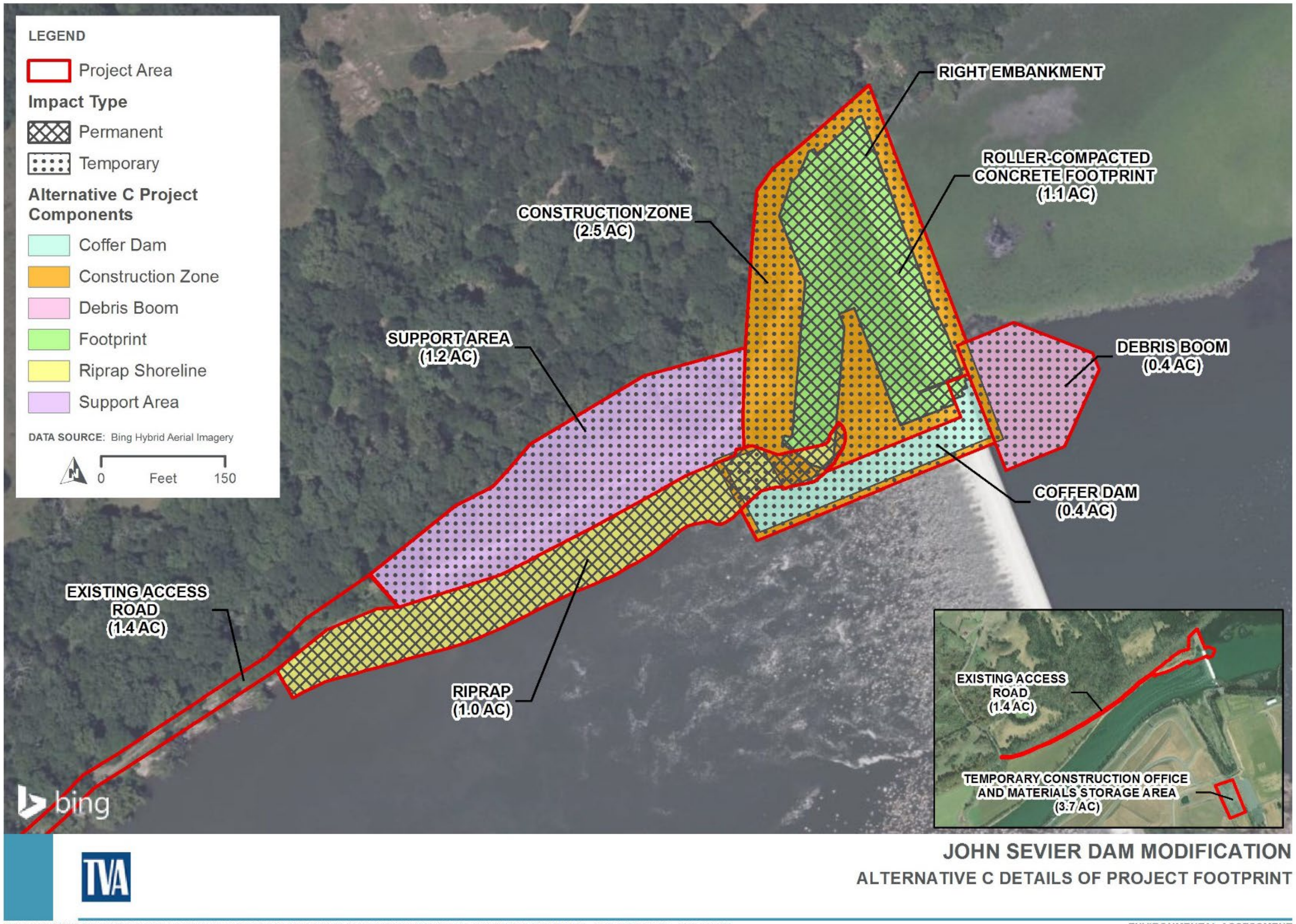


**Figure 2.1-7. Proposed Alternative C Project Footprints for the JSF Dam Modification Project**

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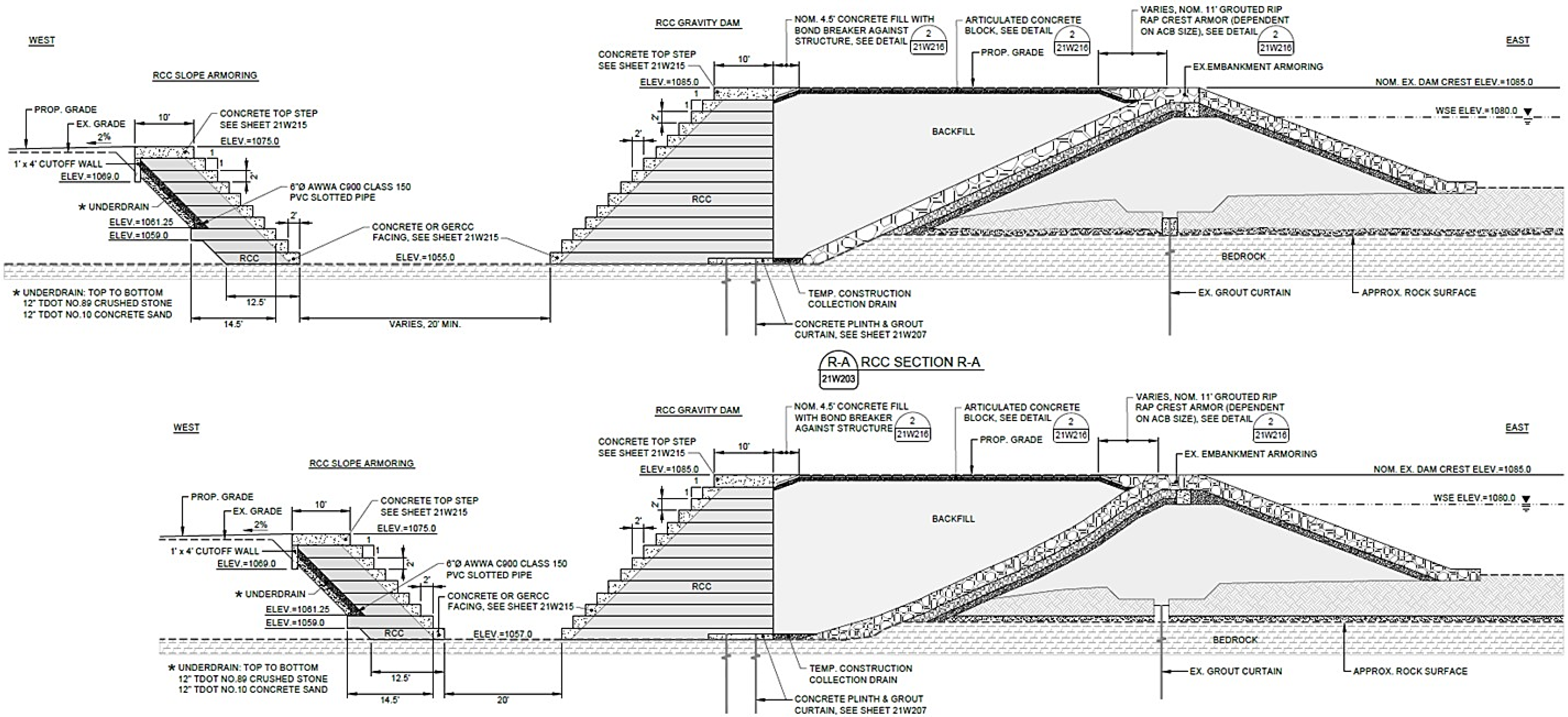


Figure 2.1-8. Details for the RCC gravity dam downstream of the right embankment for the JSF Dam Modification Project

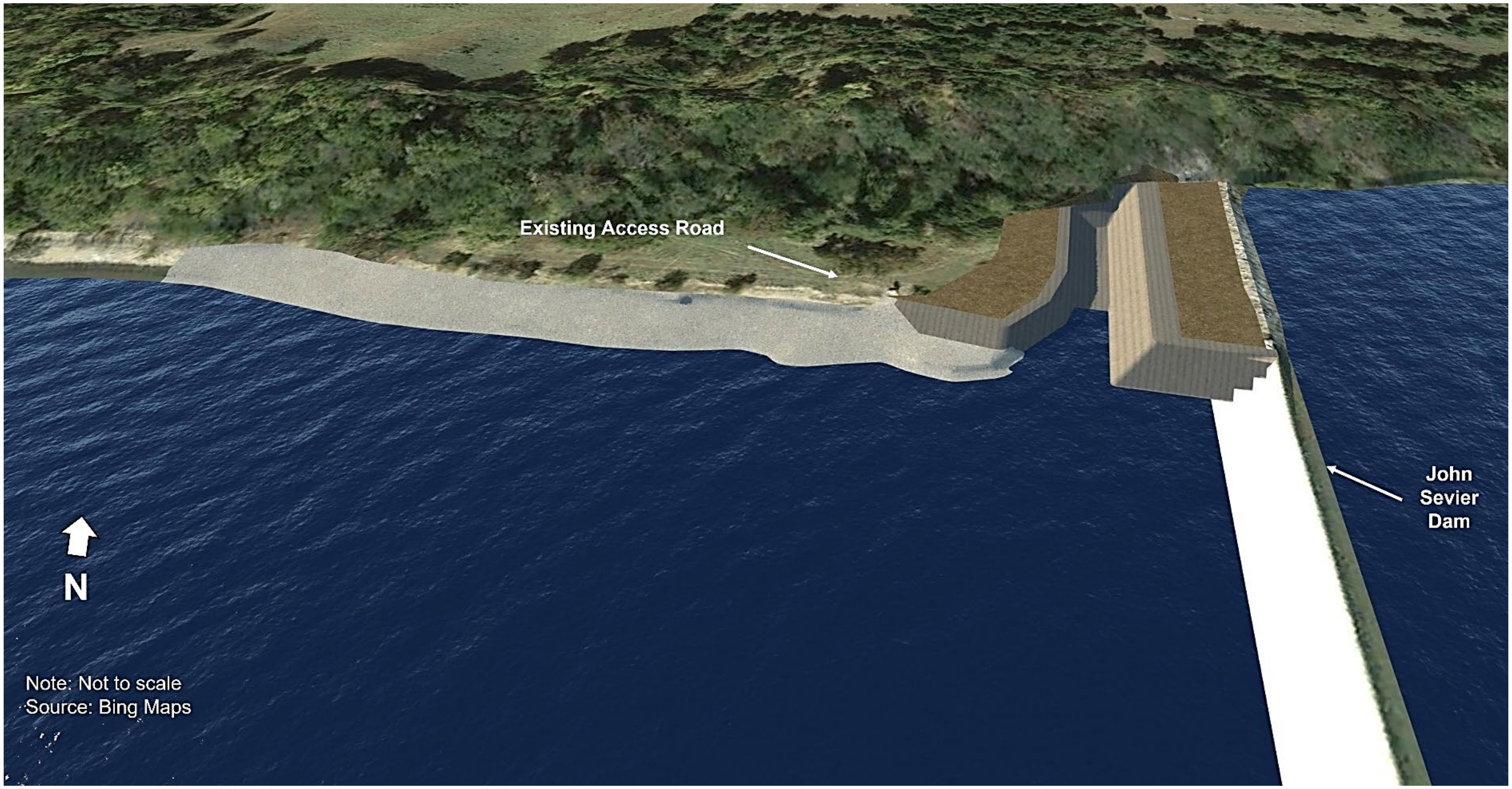


**Figure 2.1-9. Alternative C Perspective Looking at the Right Abutment of JSF Dam from the Cherokee Reservoir**

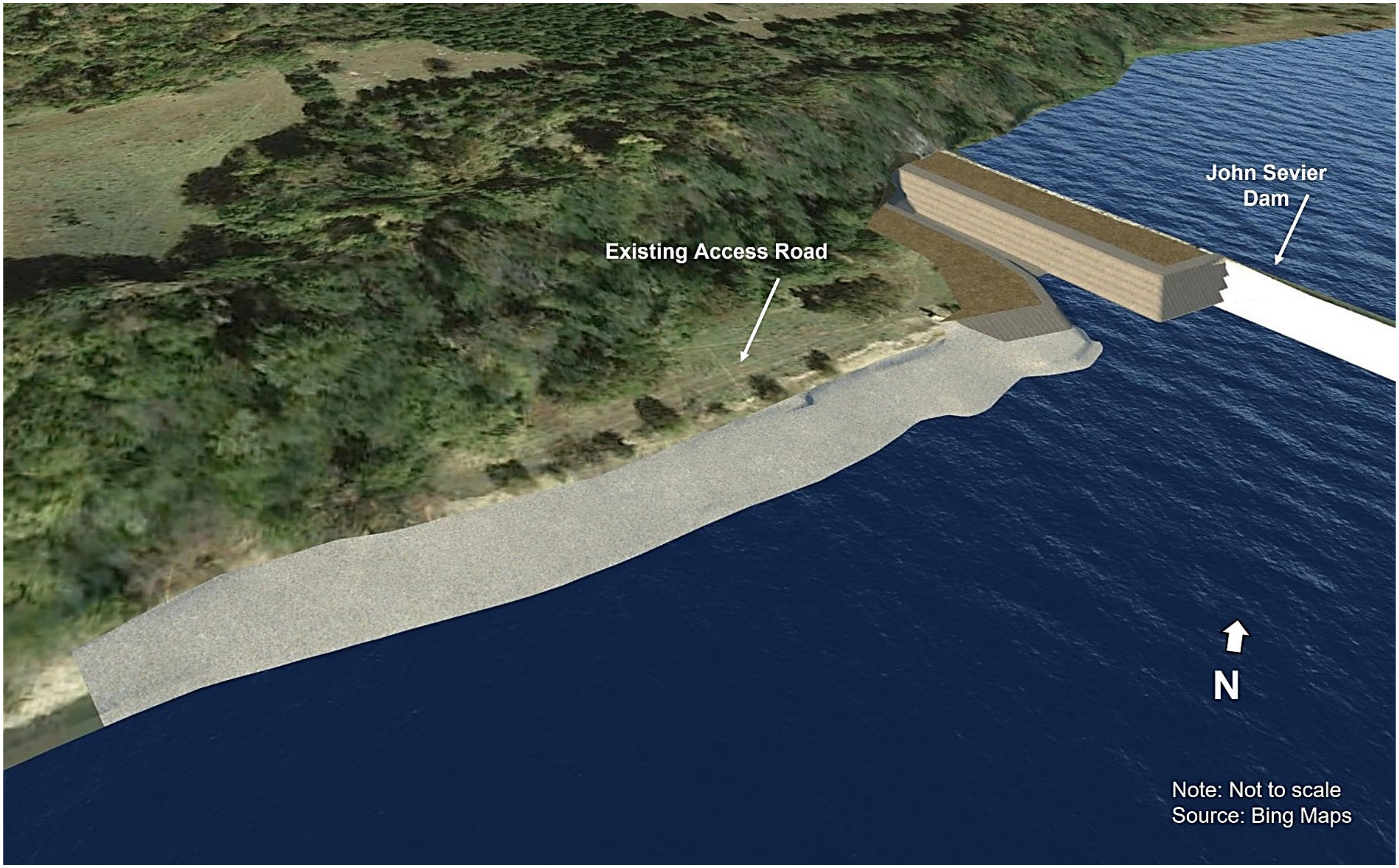


**Figure 2.1-10. Alternative C Perspective from the Downstream Side of the JSF Dam**

### 2.1.3.1 Site Mobilization and Environmental Controls

The temporary laydown area for a construction office and material storage described in Alternative B and shown in Figure 2.1-1 would also be utilized for Alternative C. The Project Area mobilization and BMPs for sediment and erosion control would also be the same as those for Alternative B. With the narrow access road and small laydown area, construction operations would be staggered. Construction related traffic is expected to require up to 75 truckloads per day. The following schedule of work is recommended; these activities are described in further detail below:

- Water diversion and control
- Excavation and foundation preparation
- Grouting
- Roller-compacted concrete (RCC) construction
- Earthen backfill placement
- Demobilization and site stabilization

Construction of the RCC gravity dam would be completed in 7 to 8 months assuming 10-hour day shifts, Monday – Friday; however, RCC placement may occur at night if construction occurs in the summer months due to temperatures during the day.

### 2.1.3.2 Water Diversion and Control

The removal of water that seeps into the work area would be necessary throughout construction to prevent water from impacting the concrete before it cures. However, the control of water during construction of the RCC structure is less important than it is for Alternative B since the RCC can be overtopped within 1 day of the placement of a layer and cleanup is simply removal of debris and mud from the RCC surface. A temporary coffer dam would be constructed similar to Alternative B as shown in Figure 2.1-8 and Figure 2.1-11. Approximately 5,700 cy of granular material may be feasible since a smaller downstream excavation footprint is required and the RCC is more resistant to water damage. A temporary flood barrier may also be needed on the existing dam crest to minimize overtopping of the dam during construction, as illustrated in 2.1-11. Additionally, to limit the potential for debris impacts on this structure a debris diversion floating boom would be placed directly upstream of the diversion structure to divert potential floating debris from impacting the diversion structure. The floating debris boom would be placed across three anchorage points made from temporary 24” nominal diameter (approximately) vertical spuds or submerged concrete blocks placed in a “V” pattern. The boom and temporary spuds would be removed following completion of the project.

Sumps, pits, and dewatering wells may also be needed to drain the work area from precipitation and groundwater infiltration. Dewatering silt bags would be employed to dry sediments; water from the dewatering bags would be discharged back into the Cherokee Reservoir.

### 2.1.3.3 Excavation and Foundation Preparation

Approximately 4,750 cy of soil and 700 cy of rock would be excavated from the right bank downstream of the dam as shown in Figure 2.1-8 and Figure 2.1-11. Excavated soils would be tested to verify they are not contaminated. Soils would be reused on-site, hauled to TVA-owned property for beneficial reuse at JCC, or disposed of off-site at an appropriate existing permitted landfill, depending on test results. The location of the off-site disposal would be determined based on sampling results. Disposal, beneficial use, and storage of soils would follow TVA procedures for soil placement and disposal. Portions of the abutment may need to be excavated to shape the abutment for earthfill placement. Bedrock and loose rocks/gravel along the downstream toe between the dam and the excavation areas may also need to be excavated to prepare the foundation for construction of the RCC gravity dam and the backfill. Foundation preparation would include the removal of rock ledges, infilling of joints and gouges with dental concrete, and cleaning of the rock surface for geologic mapping, and grouting.


**Figure 2.1-11. General Illustration of Proposed Water Control and Diversion Measures and Excavation Areas for Alternative C of the JSF Dam Modification Project (aerial image from Bing Maps)**

#### 2.1.3.4 Grouting

Figure 2.1-8 illustrates the grouting that would be conducted from a concrete plinth at the toe of the existing dam. The grouting would be utilized to address potential backward erosion piping into karst features under the right embankment and would be a single or double lined grout curtain to a depth identified by the geotechnical and geological investigation. The grout curtain is estimated to require approximately 27,200 gallons of grout. Contact or consolidation grouting may also be required beneath the footprint of the entire RCC gravity dam to address weak foundation zones and to close joints, bedding planes, and potential cavities in the bedrock foundation. All grout would be batched on-site from cement and admixture materials hauled to the Project Area.

#### 2.1.3.5 Roller-Compacted Concrete Construction

The RCC gravity dam would be constructed in approximately 1-ft lifts using RCC that is batched at an off-site concrete plant and hauled to the Project Area in conventional dump trucks, requiring up to 75 truckloads per day of RCC delivered to the Project Area. RCC is placed with traditional earth moving equipment and compacted with traditional earthfill compaction equipment. Approximately 11,000 cy of RCC and 900 cy of conventional concrete would be required to construct the RCC gravity dam. Bedding (bonding) mortar is also used to tie the RCC lifts together once the lift surface reaches a specified maturity. Bedding mortar would preferably be batched off-site and typically used once per day. Generally, one lift can be placed each day since the preceding lifts need to cure and develop strength to support additional lifts. Micropiles may be utilized in the RCC gravity dam at the training wall wrap around section to ensure pressures are evenly transmitted from the RCC gravity dam to the bedrock beneath and immediately downstream of the existing concrete overfall spillway.

The aesthetics of RCC gravity dam varies based on the placement methods and the mix design. Completed RCC structures typically have an exposed honeycomb-like appearance, and the horizontal lift surface varies. If a traditional concrete finish is needed for the structure, then a traditional concrete facing or grout enriched RCC facing would be utilized. Figure 2.1-12 illustrates a typical completed RCC project. The figure illustrates that the downstream face of the steps is finished with grout enriched RCC. The tops of the steps (shown in the bottom, right corner of the figure) are not finished and have a honeycomb-like appearance.

**Figure 2.1-12. Typical completed RCC structure.**

The area between the RCC gravity dam and the existing right embankment would be backfilled with approximately 11,500 cy of earthen material from an existing, permitted, off-site borrow source or from the on-site downstream floodplain and foundation excavation if suitable material is encountered. The earthen material would require about 1,280 truckloads total and assumes no more than 75 trucks per day. The top surface of the backfill may be lined with an erosion resistant material such as RCC, an articulated concrete block mat, or grout to prevent erosion of the backfill during overtopping events.

#### 2.1.3.6 Demobilization and Site Stabilization

Once the RCC structure is completed and the earth backfill is placed between the RCC gravity dam and the existing dam, all equipment and personnel would be demobilized from the Project Area. Except for the riprap bank stabilization adjacent to the access road, the areas disturbed during construction would be returned to pre-existing contours and stabilized with permanent vegetation. Sediment and erosion control measures would stay in place until the Project Area is permanently stabilized.

### 2.1.4 Alternatives Considered but Eliminated from Further Discussion

TVA conducted a preliminary analysis of removal of the JSF Dam. In addition to the removal of the existing dam structure, the accumulated mercury laden sediment located upstream of the dam would likely need to be remediated which might involve removal and disposal. Long-term supplemental investigations and assessment of risk of the mercury laden sediment being performed by the Olin Superfund would inform actions that the Superfund may need to take to address the accumulation of impacted sediment. Additionally, without the reservoir created by the dam, a new water intake for the JCC Plant would also need to be constructed to enable the continued operation of the generating plant. TVA has determined that the costs would be prohibitive at this time; therefore, this alternative was eliminated from further consideration.

## 2.2 Comparison of Alternatives

The potential environmental effects that could result from the three alternatives, Alternative A-No Action; Alternative B-Rock Riprap; and Alternative C-RCC Gravity Dam, are evaluated in this EA. Impact analyses are based on current and potential future conditions at the JSF Dam, proximal downstream and upstream river reaches, and the surrounding area. The overall Project Area includes an access road, construction laydown area, construction zone, and final structure footprint area, totaling approximately 5.1 acres, on the north side of the Cherokee Reservoir as well as use of an approximately 3.7-acre temporary laydown area for a construction office and material storage on the south side of the Cherokee Reservoir on the JCC Plant site. The access road, construction laydown area, construction zone, and proposed laydown area for a temporary construction office and material storage area are the same for Alternative B and C, with impacts differing primarily from the proposed structure footprint (i.e., riprap versus RCC gravity dam).

Table 2.2-1 summarizes and compares impacts from the three alternatives. The No Action Alternative (Alternative A) would not result in construction impacts identified under Alternative B and Alternative C, but the No Action Alternative does not address the purpose and need of the project. Under the No Action Alternative, overtopping of the right embankment would continue. Over time, continued overtopping of the right embankment could erode the embankment and increase the risk of dam failure, which could result in the downstream release of potentially mercury laden sediments.

Impacts evaluated may be beneficial or adverse and may apply to the full range of natural, aesthetic, historic, cultural, and socioeconomic resources within the Project Areas of each alternative and within the surrounding areas. Impact severity is dependent upon their relative magnitude and intensity and resource sensitivity. In this document, four descriptors are used to characterize the level of impacts in a manner that is consistent with TVA's current practice.

In order of degree of impact, the descriptors are as follows:

- No Impact (or "absent") – Resource not present or, if present, not affected by project alternatives under consideration.
- Minor – Environmental effects are not detectable or are so minor that they would not noticeably alter any important attribute of the resource.
- Moderate – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- Large – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

A comparison of the environmental consequences associated with each alternative is presented in Table 2.2-1.

**Table 2.2-1. Summary and Comparison of Alternatives by Resource Area**

| Resource Area | No Action - Alternative A | Additional Riprap Armoring - Alternative B | Roller Compacted Concrete Gravity Dam - Alternative C |
|---|---|---|---|
| Land Use | Potential minor, temporary impacts to land use within the Project Area would occur from proposed maintenance activities.<br>Moderate impacts to soils beneath the existing right embankment and large adverse environmental consequences associated with potential dam failure, including the potential downstream migration of mercury laden sediments. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur. | Minor temporary and permanent impacts to land use due to construction activities, riprap placement, and expansion of developed area. Minor impacts due to permanent conversion of 0.61-acre deciduous forest and 1.2-acre hay/pasture. Minor temporary impacts to approximately 0.67-acre hay/pasture due to disturbance, moderate impacts to 1.0-acre deciduous forest due to clearing and time needed for regeneration. Temporarily disturbed areas would be returned to pre-construction conditions and stabilized with permanent grass; forested areas expected to take longer to re-vegetate than hay/pasture areas. Due to the minor nature of impacts to land use, cumulative effects are not anticipated. | Minor temporary and permanent impacts to land use due to construction activities and from construction of the RCC. Minor impacts due to the permanent conversion of forested (0.54-acre) and hay/pasture (0.85-acre) to developed areas. Minor temporary impacts due to disturbance or temporary fill to 0.98-acre of hay/pasture, and moderate impact to 1.1 acre of deciduous forest due to the expected regeneration time. Temporarily disturbed areas would be returned to pre-construction conditions and stabilized with permanent grass. Due to the minor nature of impacts to land use, cumulative effects are not anticipated. |
| Soils and Prime Farmland | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br>Moderate potential impacts to soils beneath the existing right embankment and large adverse environmental consequences associated with dam failure, including the potential downstream migration of mercury laden sediments that could potentially impact prime farmland soils. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur. | Minor temporary impacts to approximately 1.5 acres of soils would occur due to disturbance in the construction zone and support area. Minor permanent impacts due to fill within the riprap armoring footprint and riprap shoreline stabilization would total 0.99 acre. Temporarily impacted soils would be stabilized upon completion of the Project and mitigated through BMPs. Soils categorized as prime farmland within the Project Area are considered converted soils due to the industrial setting, therefore no impacts to prime farmland soils are expected. Due to the overall minor impacts to soils, no expectation for agricultural practices to take place in the Project Area in the future, and no additional anticipated actions following construction, no cumulative effects are expected. | Minor temporary impacts to approximately 1.7 acre of soils would occur due to disturbance in construction zone and support area. Minor permanent impacts due to fill within the riprap armoring footprint and riprap shoreline stabilization would total 0.73 acre. Temporarily impacted soils would be stabilized upon completion of the Project and mitigated through BMPs. Soils categorized as prime farmland within the Project Area are considered converted soils due to the industrial setting; therefore, no impacts to prime farmland soils are expected. Due to the overall minor impacts to soils and lack of prime farmland, cumulative effects are not anticipated. Due to the overall minor impacts to soils, no expectation for agricultural practices to take place in the Project Area in the future, and no additional anticipated actions following construction, no cumulative effects are expected. |
| Geology and Groundwater | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br>Large impacts to groundwater near the JSF Dam through karst features and environmental consequences associated with dam failure, including the potential downstream migration of mercury laden sediments that could impact groundwater. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur. | Minor impacts to the local geology from excavating rock and earthen materials from the downstream bank, extending 100 ft downstream from dam, and minor to moderate impacts from contact grouting beneath the footprint of the rockfill spillway and from installation of a grout curtain, depending on the extent of karst features to be filled. No additional work after construction is complete is expected and no cumulative effects to geology or groundwater would occur. | Minor impacts to the local geology from excavating rock and earthen materials from the downstream bank, extending 60 ft downstream from dam, and minor to moderate impacts to groundwater movement depending on the extent of karst features to be filled from contact or consolidation grouting beneath the footprint of the RCC gravity dam and from installation of a grout curtain. No additional work after construction is complete is expected and no cumulative effects to geology or groundwater would occur. |
| Surface Water and Water Quality | Minor and temporary impacts associated with ongoing proposed maintenance activities.<br>Moderate to large adverse impacts to surface waters and water quality could occur downstream of the JSF Dam in the event of dam failure. Dam failure could result in the potential downstream migration of mercury laden sediments. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur. | Minor temporary impacts would occur due to temporary fill placement in surface waters totaling 1.0 acre. Moderate permanent impacts of 0.57 acre to surface waters within the RR footprint and 0.86 acre of placement of riprap for shoreline stabilization. All work would be completed with adherence to applicable regulations and permits. No additional work or impacts to surface waters are expected following completion of the Project; therefore, cumulative effects are not anticipated. | Minor temporary impacts would occur due to temporary fill placement in surface waters totaling 1.1 acre. Moderate permanent impacts of 1.4 acre to surface waters within the RRC gravity dam footprint and placement of riprap for shoreline stabilization. All work would be completed with adherence to applicable regulations and permits. No additional work or impacts to surface waters are expected following completion of the Project; therefore, cumulative effects are not anticipated. |
| Floodplains | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br>There would be an increased risk for large adverse impacts in the event of a JSF Dam failure resulting from overtopping erosion or from the migration of sediment downstream of the dam that would potentially affect the flood storage capacity of Cherokee Reservoir or increase flood elevations in Cherokee Reservoir, or both. Depending on the magnitude of dam failure and extent of potential downstream impacts from sediments, cumulative effects could occur. | Minor adverse impacts on floodplains from the placement of approximately 14,650 cy of net fill material within the 100-year floodplain of the Holston River and Cherokee Reservoir flood storage zone for the dam modification plus about 2,500 cy of net fill material within the 100-year floodplain and flood storage zone for the access road bank stabilization. Impacts would be minor because BMPs would be implemented during construction as well as minimization and mitigation efforts and because 100-year flood elevations would not increase more than 1.0 foot. No additional work or fill of the 100-year floodplain is expected following completion of the Project; therefore, cumulative effects are not anticipated. | Minor adverse impacts on floodplains from the placement of approximately 17,950 cy of net fill material within the 100-year floodplain of the Holston River and Cherokee Reservoir flood storage zone for the dam modification plus about 2,500 cy of net fill material within the 100-year floodplain and flood storage zone for the access road bank stabilization. Impacts would be minor because 100-year flood elevations would not increase more than 1.0 ft and because BMPs would be implemented during construction as well as minimization and mitigation efforts. No additional work or fill of the 100-year floodplain is expected following completion of the Project; therefore, cumulative effects are not anticipated. |

| Resource Area | No Action - Alternative A | Additional Riprap Armoring - Alternative B | Roller Compacted Concrete Gravity Dam - Alternative C |
|---|---|---|---|
| Wetlands | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Moderate adverse indirect impacts to wetlands in the event of dam failure. Dam failure could result in the potential downstream migration of mercury laden sediments as well as reduced hydrology to wetland complexes upstream of the JSF Dam. Depending on the magnitude of dam failure including the amount of time for repair and remediation, and extent of potential downstream impacts from sediments, cumulative effects could occur. | No direct impacts to wetlands. No wetlands are located in the Project Area; therefore, construction would not directly impact wetlands. Construction activities within the Alternative B construction area are not expected to have impacts on upstream water levels or wetlands. BMPs would be implemented during construction to reduce potential indirect impacts from sedimentation to downstream wetlands. No cumulative effects are anticipated. | No direct impacts to wetlands. No wetlands are located in the Project Area; therefore, construction would not directly impact wetlands. Construction activities within the Alternative C construction area are not expected to have impacts on upstream water levels or wetlands. BMPs would be implemented during construction to reduce potential indirect impacts from sedimentation to downstream wetlands. No cumulative effects are anticipated. |
| Vegetation | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Moderate impacts could occur to vegetation communities if dam failure occurs. Depending upon the nature of the failure, dam failure could result in the deposition of sediments and increase erosion downstream of the dam. Depending on the magnitude of dam failure and extent of potential downstream impacts from sediments or erosion, cumulative effects could occur. | Minor permanent impacts to approximately 0.21 acre of deciduous trees and 0.08 acre of herbaceous fields, and minor temporary impacts to 0.52 acre of deciduous trees and 0.69 acre of herbaceous fields during construction but would be restored to pre-construction conditions to the extent practicable. Forested areas would be expected to take longer to re-vegetate than hay/pasture areas. Much of the area will be allowed to regenerate following construction and additional work is not anticipated; therefore, cumulative effects are not expected. | Minor direct, permanent impacts to approximately 0.15 acre of deciduous trees and 0.03 acre of herbaceous fields. Approximately 0.59 acre of deciduous trees and 0.75 acre of herbaceous fields would be impacted temporarily during construction but would be restored to pre-construction conditions to the extent practicable. Forested areas would be expected to take longer to re-vegetate than hay/pasture areas. Much of the area will be allowed to regenerate following construction and additional work is not anticipated; therefore, cumulative effects are not expected. |
| Wildlife | Potential minor impacts associated with ongoing proposed maintenance activities should they involve tree removal.<br><br>Large negative direct and indirect impacts to wildlife in the event of dam failure. Dam failure could result in the potential downstream migration of mercury laden sediments, damage or remove habitat, and increase erosion. Depending on the severity of the release, or timing of tree removal for maintenance actions this alternative could result in large adverse environmental consequences to wildlife and their habitats and/or cumulative effects. | Minor and temporary impacts to wildlife from construction activities that may disperse mobile species into surrounding areas and due to the small number of trees to be removed, proposed removal occurring in winter, and availability of adjacent suitable habitat. No long-term or additional impacts are expected to wildlife and therefore no cumulative effects are anticipated. | Minor and temporary impacts to wildlife from construction activities that may disperse mobile species into surrounding areas and due to the small number of trees to be removed, proposed removal occurring in winter, and availability of adjacent suitable habitat. No long-term or additional impacts are expected to wildlife and therefore no cumulative effects are anticipated. |
| Aquatic Ecology | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Large impacts to water quality and ecological health functions downstream of the dam could occur if dam failure results in a release of mercury laden sediments. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur. | Minor impacts to aquatic ecology either directly or indirectly from the placement of riprap or temporary increases in suspended sediment from construction; BMPs would be implemented to reduce impacts. Cumulative effects are not anticipated as additional in-water or permanent habitat loss is not expected. | Minor impacts to aquatic ecology either directly or indirectly from the placement of riprap or temporary increases in suspended sediment from construction; BMPs would be implemented to reduce impacts. Cumulative effects are not anticipated as additional in-water or permanent habitat loss is not expected. |
| Threatened and Endangered Species | Potential large effects to downstream rare plant communities in the event of dam failure. Potential minor impacts associated with ongoing proposed maintenance activities should they involve removal of suitable bat habitat.<br><br>Moderate to large impacts to terrestrial species and large impacts to aquatic species in the event of dam failure. Dam failure could result in the potential downstream migration of mercury laden sediments, directly or indirectly impact species present, and damage or remove habitat. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur. | Proposed actions under Alternative B may affect Indiana bat, northern long-eared bat, and gray bat. Activities with the potential to affect these species have been addressed in TVA's Section 7 Programmatic Consultation with USFWS, updated in May 2023. Outside of this programmatic consultation, TVA has determined that the proposed actions under Alternative B would not jeopardize the continued existence of the proposed endangered tricolored bat.<br><br>Other T&E species would either not be affected, are not present, or effects would be indirect and minor. Cumulative effects are not expected. | Proposed actions under Alternative C may affect Indiana bat, northern long-eared bat, and gray bat. Activities with the potential to affect these species have been addressed in TVA's Section 7 Programmatic Consultation with USFWS, updated in May 2023. Outside of this programmatic consultation, TVA has determined that the proposed actions under Alternative B would not jeopardize the continued existence of the proposed endangered tricolored bat.<br><br>Other T&E species would either not be affected, are not present, or effects would be indirect and minor. Cumulative effects are not expected. |

| Resource Area | No Action - Alternative A | Additional Riprap Armoring - Alternative B | Roller Compacted Concrete Gravity Dam - Alternative C |
|---|---|---|---|
| Natural Areas, Parks and Recreation | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Large adverse impacts in the event of dam failure. Dam failure could result in the potential downstream migration of mercury laden sediment directly impacting natural areas and recreation downstream of the JSF Dam. Depending on the magnitude of dam failure including the amount of time for repair and remediation, and extent of potential downstream impacts from sediments, cumulative effects could occur. | Minor and temporary direct impacts to Cherokee Reservoir from construction of the dam. Minor indirect impacts to Cherokee Reservoir from construction noise, visual intrusions, and runoff, and to recreation areas within 2-mi of the JSF Dam; BMPs would be implemented to minimize indirect impacts. No cumulative adverse impacts are expected. Permanent beneficial impacts to recreation would result from the reduced risk of a dam failure or potential downstream release of mercury laden sediments. Cumulative effects are not anticipated. | Minor and temporary direct impacts to Cherokee Reservoir from construction of the dam. Minor indirect impacts to Cherokee Reservoir from construction noise, visual intrusions, and runoff, and to recreation areas within 2-mi of the JSF Dam; BMPs would be implemented to minimize indirect impacts. No cumulative adverse impacts are expected. Permanent beneficial impacts to recreation would result from the reduced risk of a dam failure or potential downstream release of mercury laden sediments. Cumulative effects are not anticipated. |
| Air Quality | Maintenance activities could result in minor temporary impacts to air quality associated with fugitive dust and equipment emissions.<br><br>Dam failure may impact air quality indirectly due to increased vehicle traffic and fugitive dust if cleanup/mitigation efforts are required on-site. Otherwise, failure of the right dam embankment would not cause direct changes to air quality and no cumulative effects are expected. | Minor and temporary impacts to local air quality within immediate area of the construction access road and Alternative B construction area from fugitive emissions and dust. No cumulative effects to air quality are anticipated to occur with Alternative B. | Minor and temporary impacts to local air quality within immediate area of the construction access road and Alternative C construction area from fugitive emissions and dust. No cumulative effects to air quality are anticipated to occur with Alternative C. |
| Greenhouse Gases & Climate Change | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Dam failure may impact greenhouse gas (GHG) emissions indirectly due to increased vehicle traffic and fugitive dust if cleanup/mitigation efforts are required on-site. Otherwise, failure of the right dam embankment would not cause direct changes to GHG emissions, and no cumulative effects are expected. | Minor and temporary impacts from GHG emissions produced from mobile construction equipment; TVA requires on-site contractors to maintain engines and equipment in good working order. No cumulative effects to GHG emissions or climate change are anticipated to occur with Alternative B. | Minor and temporary impacts from GHG emissions produced from mobile construction equipment; TVA requires on-site contractors to maintain engines and equipment in good working order. No cumulative effects to GHG emissions or climate change are anticipated to occur with Alternative C. |
| Noise and Vibration | Minor and temporary impacts to sensitive receptors from long-term maintenance activities and increased vehicles if cleanup/mitigation efforts are required on-site due to a dam failure. No cumulative effects are anticipated. | Minor and temporary impacts to the ambient sound environment at the JSF Dam from construction-related noise and vibration based on the distance to the nearest receptors (about 0.8 mile away). Cumulative effects are not anticipated. | Minor and temporary impacts to the ambient sound environment at the JSF Dam from construction-related noise and vibration based on the distance to the nearest receptors (about 0.8 mile away). Cumulative effects are not anticipated. |
| Transportation | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Minor and temporary impacts to traffic from increased vehicles if cleanup and mitigation efforts are required on-site due to a dam failure. Existing transportation network and traffic conditions would be expected to remain as they are at present, and no cumulative effects would occur. | Temporary minor to moderate impacts to transportation and traffic during construction due to the influx of workers traveling to and from the Project Area and construction trucks for hauling; traffic flow would be managed to prioritize local residents needs and minimize adverse impacts to traffic and transportation; estimate approximately 75 trucks per day to deliver or remove materials during construction. No cumulative effects are anticipated. | Temporary minor to moderate impacts to transportation and traffic during construction due to the influx of workers traveling to and from the Project Area and construction trucks for hauling; traffic flow would be managed to prioritize local residents needs and minimize adverse impacts to traffic and transportation; estimate approximately 75 trucks per day to deliver or remove materials during construction. No cumulative effects are anticipated. |
| Navigation | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Large direct and indirect impacts to navigation could occur with a dam failure. The magnitude of dam failure and resulting downstream flooding and sedimentation would determine the extent of impact, and cumulative effects would be possible. | Minor impacts to recreational navigation to be minimized through use of reflective tape and lighting at nighttime. TVA would maintain the current restricted area near the JSF dam or extend slightly during construction. Cumulative effects are not anticipated to Navigation. | Minor impacts to recreational navigation to be minimized through use of reflective tape and lighting at nighttime. TVA would maintain the current restricted area near the JSF dam or extend slightly during construction. Cumulative effects are not anticipated to Navigation. |
| Cultural Resources | No effects. | No effects. | No effects. |
| Visual Resources | Minor temporary visual impacts would be anticipated from the proposed maintenance activities from equipment and vehicles being used on site during maintenance and repair activities. Minor impacts due to changes to the appearance of the dam if dam failure were to occur. Failure may necessitate increased vehicles on-site if cleanup and mitigation efforts are required. Minor temporary impacts when equipment and vehicles are on site for maintenance and repairs. No permanent or cumulative effects are anticipated. | Minor and temporary impacts to visual resources during construction; visual observation points limited, mostly limited to recreational boaters and fishermen on the Holston River, Cherokee Reservoir, and at John Sevier TVA Boat Ramp. Cumulative effects are not anticipated. | Minor and temporary impacts to visual resources during construction; visual observation points limited, mostly limited to recreational boaters and fishermen on the Holston River, Cherokee Reservoir, and at John Sevier TVA Boat Ramp. Cumulative effects are not anticipated. |

| Resource Area | No Action - Alternative A | Additional Riprap Armoring - Alternative B | Roller Compacted Concrete Gravity Dam - Alternative C |
|---|---|---|---|
| Solid & Hazardous Waste | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Large and long-term adverse effect downstream of the JSF Dam could occur with the potential downstream migration of mercury laden sediments currently located upstream of the JSF Dam. Cumulative effects could occur depending on downstream extent of flooding and sediment deposition. | Specific procedures, such as, but not limited to, a dust control plan, spill prevention, control, and countermeasures plan, and waste management plan, would be implemented during construction to minimize potential impacts to the environment from typical construction debris and potential spills during construction. Overall impacts from solid and hazardous waste generation and disposal would be minor; no cumulative effects are anticipated. | Specific procedures, such as, but not limited to, a dust control plan, spill prevention, control, and countermeasures plan, and waste management plan, would be implemented during construction to minimize potential impacts to the environment from typical construction debris and potential spills during construction. Overall impacts from solid and hazardous waste generation and disposal would be minor; no cumulative effects are anticipated. |
| Utilities and Service Systems | No impacts associated with ongoing proposed maintenance activities.<br><br>Large impacts to water supply if dam failure were to result in the potential downstream migration of mercury laden sediments. A failure of the dam would dewater the JCC Plant intake located upstream of the dam and would result in large impacts to cooling water dependent operations at the plant. | No effects to existing utilities or water supply are anticipated as disruptions would be avoided through early communication regarding the Project and calling "Tennessee 811" to confirm utilities prior to starting work. Long-term beneficial impacts from the decreased risk of releasing mercury laden sediments downstream. No cumulative effects are anticipated. | No effects to existing utilities or water supply are anticipated as disruptions would be avoided through early communication regarding the Project and calling "Tennessee 811" to confirm utilities prior to starting work. Long-term beneficial impacts from the decreased risk of releasing mercury laden sediments downstream. No cumulative effects are anticipated. |
| Socioeconomics and Environmental Justice | Minor temporary adverse impacts to EJ populations from potential increases in traffic during maintenance activities and increases in fugitive air emissions and dust and noise levels during construction.<br><br>Dam failure could have a large and long-term adverse effect to groundwater near the JSF Dam through established karst features, nearby recreational and natural areas, and surface waters downstream by potentially releasing downstream mercury laden sediments currently located upstream of the JSF Dam. This could impact socioeconomic resources or environmental justice communities located downstream of the JSF Dam. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur. | Minor and temporary beneficial impact on socioeconomics from the employment of about 30 workers for construction; potential temporary beneficial effects to EJ populations related to employment opportunity; minor temporary adverse impacts to EJ populations from potential increases in traffic during construction and increases in fugitive air emissions and dust and noise levels during construction. Cumulative effects to EJ communities are not expected. | Minor and temporary beneficial impact on socioeconomics from the employment of about 30 workers for construction; potential temporary beneficial effects to EJ populations related to employment opportunity; minor adverse impacts to EJ populations from potential increases in traffic during construction and increases in fugitive air emissions and dust and noise levels during construction. Cumulative effects to EJ communities are not expected. |
| Safety | Potential minor, temporary impacts associated with ongoing proposed maintenance activities.<br><br>Moderate adverse impacts to safety if dam failure were to occur due to the potential downstream migration of mercury laden sediments currently located upstream of JSF Dam. Potential permanent impacts to downstream fish consumption advisory based on extent of impact from a dam failure, should one occur. Depending on extent of downstream reach of the dam failure, cumulative effects may occur and could include an extension of the fish advisory further downstream. | Minor and temporary impacts to public and occupational health and safety from potentially increasing restrictive access areas and increased traffic. No cumulative effects are anticipated. | Minor and temporary impacts to public and occupational health and safety from potentially increasing restrictive access areas and increased traffic. No cumulative effects are anticipated. |

## 2.3 Summary of TVA Commitments and Proposed Mitigation Measures

In addition to the requirements of any necessary permits, TVA would employ standard practices and routine measures and other project-specific measures to avoid and minimize effects to resources from implementation of the Proposed Action Alternatives. TVA's processes for dam modifications are designed to avoid and/or minimize potential adverse environmental effects, to the extent practicable. Potential effects are also reduced through standard pollution prevention measures and environmental controls. TVA would implement minimization and mitigation measures. These have been developed with consideration of BMPs, permit requirements, and adherence to erosion and sediment control plans. TVA would utilize standard BMPs to minimize erosion during construction activities. These BMPs are described in *A Guide for Environmental Protection and BMPs for TVA Construction and Maintenance Activities – Revision 4* (TVA 2022b) and the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012).

### 2.3.1 Best Management Practices and Routine Measures

#### 2.3.1.1 Floodplains

- The least amount of fill and access road riprap as practicable would be used to achieve project objectives.
- Any excess excavated material would be disposed of outside 100-year floodplains.
- Any road improvements would be done in a manner such that upstream flood elevations would not be increased by more than 1.0 ft.
- The laydown area would be returned as close as practicable to pre-construction conditions following completion of the project.
- An evacuation plan would be created for removal of flood-damageable equipment and materials from the floodplain in the event of a flood or high-flow event.

#### 2.3.1.2 Soils

- TVA would develop a Stormwater Pollution Prevention Plan (SWPPP) that identifies mitigation measures and BMPs that would be implemented during construction to reduce stormwater runoff. Erosion and sediment controls would be installed or implemented in accordance with the provisions of the Tennessee Erosion and Sediment Control Handbook and TVA's NPDES permit.
- Fill materials would be clean and free of contaminants.
- TVA would stabilize disturbed areas with permanent vegetation upon construction completion.
- TVA would install BMPs for sediment and erosion control and these controls would remain in place until the Project Area was permanently stabilized.
- TVA would employ sedimentation barriers and dewatering silt bags to capture sediment and dry it out; water from the dewatering bags would be discharged back into the Cherokee Reservoir.
- TVA would seed disturbed areas with native or non-invasive plant species to prevent the introduction and spread of invasive species.
- Fugitive air and dust emission from construction activities would be reduced and controlled through the implementation of construction BMPs, which may include but are not limited to the following:
    - Covering waste or debris piles, using covered containers to haul waste and debris, and wetting unpaved vehicle access routes during hauling;

  - Enforcing vehicle speed restrictions on the on-site haul roads to minimize road dust; and
  - Requiring on-site contractors to maintain engines and equipment in good working order to improve fuel efficiency and reduce potential CO emissions from poorly operating engines and equipment.

#### 2.3.1.3 Water Resources

- TVA would request coverage under Tennessee's NPDES Construction General Permit (CGP) by submitting a NOI and site-specific SWPPP along with an application fee to TDEC. TVA would then comply with the terms and requirements of the CGP by ensuring any proposed stormwater discharge meets requirements of the SWPPP and applicable water quality standards, and other requirements as identified in the CGP permit.
- TVA would request coverage under Clean Water Act (CWA) Section 404/401 by submitting permit applications to USACE and TDEC. TVA would then comply with the terms and requirements identified in the permits.

#### 2.3.1.4 Biological Resources

- Follow U.S. Fish and Wildlife Service (USFWS) recommendations regarding biological resources and pollinator species:
- Use of downward and inward facing lighting to limit attracting wildlife, particularly migratory birds and bats; and
- Instruct construction personnel on wildlife resource protection measures, including applicable federal and state laws such as those that prohibit animal disturbance, collection, or removal, the importance of protecting wildlife resources, and avoiding unnecessary vegetation removal.

#### 2.3.1.5 Waste Management

- Develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials.

#### 2.3.1.6 Noise

- Minimize construction activities during overnight hours, where possible, and ensure that heavy equipment, machinery, and vehicles utilized at the Project Area meet all federal, state, and local noise requirements.

#### 2.3.1.7 Transportation / Navigation

- Construction activities would primarily occur during daylight hours for 5 days a week, except for Alternative C which may require work at night during summer months for the placement of RCC. A traffic plan would be established and may include measures such as using signage or posting a flag person to manage traffic flow, and prioritizing access for local residents to minimize potential adverse impacts to traffic and transportation.
- Reflective tape and lighting of barges or other equipment, including the floating debris boom, extending into the Cherokee Reservoir during construction would be advised for nighttime visibility of recreational boaters.

#### 2.3.1.8 Visual

- Use of downward- and inward-facing lighting.

#### 2.3.1.9 Air Quality/Greenhouse Gases/Climate Change

- Comply with local ordinances or burn permits if burning of vegetative debris is required and use BMPs, such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust (TVA 2022b).
- Maintain engines and equipment in good working order (TVA 2022b).
- Comply with TDEC Air Pollution Control Rule 1200-3-8, which requires reasonable precautions to prevent particulate matter (PM) from becoming airborne (TVA 2022b).
- Comply with the USEPA mobile source regulations in 40 U.S. Code of Federal Regulations (CFR) Part 85 for on-road engines and 40 CFR Part 1039 for non-road engines, requiring a maximum sulfur content in diesel fuel of 15 ppm.

### 2.3.2 Mitigation Measures

- Prior to initiating construction activities, TVA would perform a pre-construction assessment to document existing road conditions along McKinney Chapel Road. During construction, TVA would monitor McKinney Chapel Road for deteriorating conditions associated with large equipment travel related to the proposed project.
- If contaminated or suspect soils are encountered during construction, TVA would take immediate steps, if feasible, to isolate the contamination and would implement additional measures, as appropriate, such as stopping work activities in the immediate vicinity of the Project Area; making the appropriate internal and external notifications; determining appropriate sampling requirements; and coordinating for disposal of contaminated media, if necessary (based on analytical results).
- Tree removal would occur between November 15 - March 31 when listed bat species are not expected to be on the landscape. Removal of suitable habitat in winter would avoid direct impacts to bat species as bats are roosting underground at that time. TVA would also implement conservation measures identified in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with the Endangered Species Act (ESA) Section 7(a)(2), originally signed in April 2018 and updated in May 2023 (USFWS 2018, 2023a). Relevant conservation measures that would be implemented as part of the approved project are listed in the bat strategy form. The bat strategy form is included as Appendix B.

## 2.4 The Preferred Alternative

TVA's preferred alternative is Alternative C—Roller Compacted Concrete Gravity Dam.

Alternative A—No Action would result in the dam remaining in a condition that is susceptible to dam failure caused by overtopping erosion and would require costly, long-term maintenance including periodic emergency repairs that do not meet the purpose and need for action.

Alternative B— Additional Riprap Armoring would meet the purpose and need but would result in greater temporary and permanent impacts. The construction costs and length of construction periods for Alternative B and Alternative C would be comparable. Alternative B excavation in the downstream floodplain would occur along 100 linear ft of the Cherokee Reservoir below the dam.

Alternative C—Roller Compacted Concrete Gravity Dam addresses all of the dam safety failure modes of concern (see Section 1.1) and would result in the most reliable structure. Alternative C would only require excavation in the downstream floodplain along 60 linear ft of the Cherokee Reservoir below the dam, approximately 40 linear ft less than Alternative B. Further, Alternative C would result in sound structure that could immediately be subjected to overtopping without further risk of dam failure and has the lowest long-term maintenance costs associated with it.

# CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment (existing conditions) of environmental resources in the Project Area identified during project scoping (see Section 1.5) as having potential to be affected by one or more of the alternatives. The affected environment descriptions below are based on published and unpublished reports, personal communications with resource experts, and surveys conducted in August 2022. This chapter also describes the anticipated impacts (environmental consequences) of the alternatives on the various environmental resources.

## 3.1 Land Use

### 3.1.1 Affected Environment

Land use is defined as the way people use and develop land, including leaving land undeveloped and using land for agricultural, residential, commercial, and industrial purposes. The TVA JSF Dam is located on the Holston River at the upper end of the Cherokee Reservoir near Rogersville, Tennessee, in Hawkins County (see Figure 1.1-1). No relevant land use or zoning plans were identified from Hawkins County or the Town of Rogersville.

According to the National Land Cover Database (NLCD) developed by the Multi-Resolution Land Characteristics Consortium (MRLC 2019), forested and agricultural land (hay and pasture) makes up most of the land surrounding the dam with smaller pockets of residential areas to the north and south along Old Tennessee 70 and Guntown Road. The JCC Plant and former JSF Plant site comprise an industrial area immediately south of the dam. Available historical aerial photographs and U.S. Geological Survey (USGS) (USGS 2021) topographic quadrangles document that land use near the Project Area was largely rural with no development in 1892 (the first available map), with a railroad running northwest of the Project Area, across the Holston River. The 1935 topographic quadrangle of Burem, Tennessee, shows the emergence of another railroad track south of the Project Area, running through what is now the JCC/former JSF site, with several buildings near the track. The construction of the JSF Plant, the dam, and associated transmission infrastructure in the 1950s significantly changed the land use in the Project Area, which can first be seen in USGS topographic maps in 1961. Modifications were made to this area with the later deconstruction of the fossil plant and construction and operation of the JCC Plant; however, overall industrial growth in the area has been relatively limited.

The Project Area consists of flat terrain with elevation of approximately 1,060 ft above mean sea level (amsl). Topography surrounding the construction area for Alternatives B and C (i.e., the approximately 5.1 acres comprised of the construction access road, support/laydown area, the coffer dam, the construction zone, and the permanent rock riprap or RCC gravity dam structures located at the right embankment of JSF Dam) is flat where there is open water and topography increases slightly to 1,106 ft amsl northwest of the construction area.

### 3.1.2 Environmental Consequences

#### 3.1.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would result in minor land disturbance adjacent to the dam to allow for operation of construction equipment. As the JSF dam would be maintained in its current configuration, impacts associated with maintenance activities would likely be temporary. Following maintenance, the workspace would be restored to pre-construction conditions to the extent practicable. Thus, existing land uses in the immediate project would likely remain industrial and rural.

Regardless of source, internal erosion alone or that leads to a dam failure would have moderate negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment, could affect land use areas near the JSF Dam. Further, Alternative A would result in an increased risk for large adverse environmental consequences associated with dam failure from overtopping erosion. Dam failure could have a large adverse effect to land use (and other environmental resources) downstream of the JSF Dam by potentially resulting in the potential downstream migration of mercury laden sediments located upstream of the JSF Dam. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur.

#### 3.1.2.2 Alternative B

Alternative B would impact the existing right downstream facing riverbank at an approximately 300-foot-long area downstream of the dam. Modification to the existing access road would have temporary effects during construction. The proposed temporary laydown area for a construction office and material storage within the JCC Plant would have no effects since this area is an existing gravel lot. Thus, the use of the 3.7-acre site for a temporary construction office and material storage area on the JCC Plant site would not result in a change in land use. Construction activities at the dam and adjacent areas on the north side of the river would have minor temporary impacts to approximately 0.67-acre hay/pasture due to disturbance, moderate impacts to 1.0-acre deciduous forest due to clearing and time needed for regeneration, and no change to the land use of an existing 0.89-acre developed area (high, medium, and low intensity and open space) area (MRLC 2019) plus temporary impacts to forest and hay/pasture located along the existing access road. Over the long term, about 1.2-acre hay/pasture, 0.61-acre deciduous forest, and 0.6 acre developed (medium and low intensity and open space) areas would be converted to developed, medium intensity (industrial) land use (Figure 3.1-1). Overall, impacts to land use would be minor and cumulative effects are not anticipated.

#### 3.1.2.3 Alternative C

The impacts of Alternative C would be similar to and somewhat less than those described in Section 3.1.2.2 for Alternative B due to the somewhat smaller structure footprint. Moderate, long-term impacts would impact approximately 1.1-acre of deciduous forest, short-term minor impacts to 0.98-acre of hay/pasture, and no change to the land use of 0.76 acre of developed (high, medium, and low intensity and open space) areas (MRLC 2019). Minor permanent impacts would result from the conversion of about 0.54-acre deciduous forest, 0.85-acre hay/pasture, and 0.65 acre developed (high, medium and low intensity and open space) areas to developed, medium intensity (industrial) land use (Figure 3.1-2). Overall impacts to land use would be minor and cumulative effects are not anticipated.

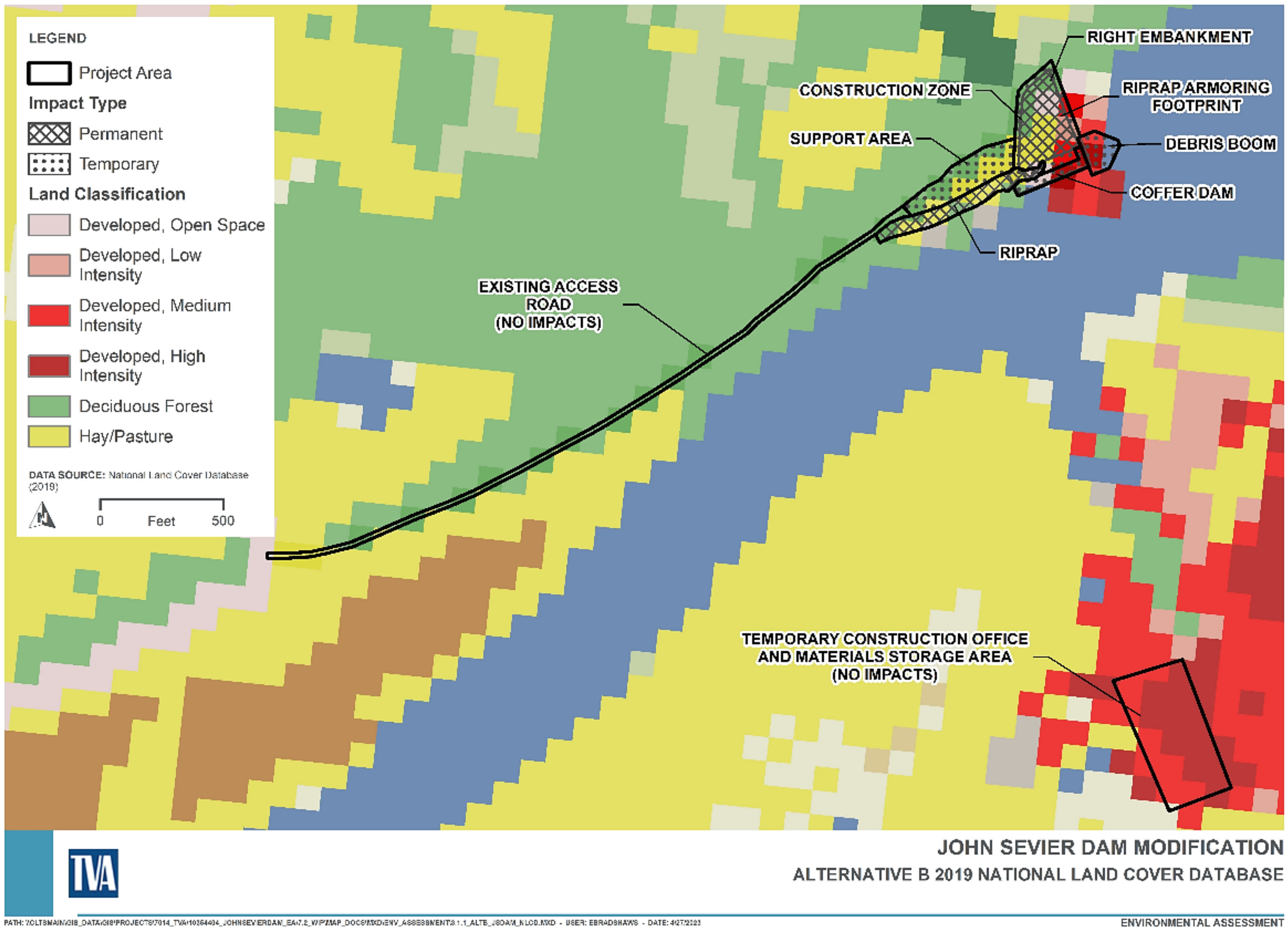


**Figure 3.1-1. Land use within the JSF Dam Project Area impacted by Alternative B (Source: NLCD 2019)**

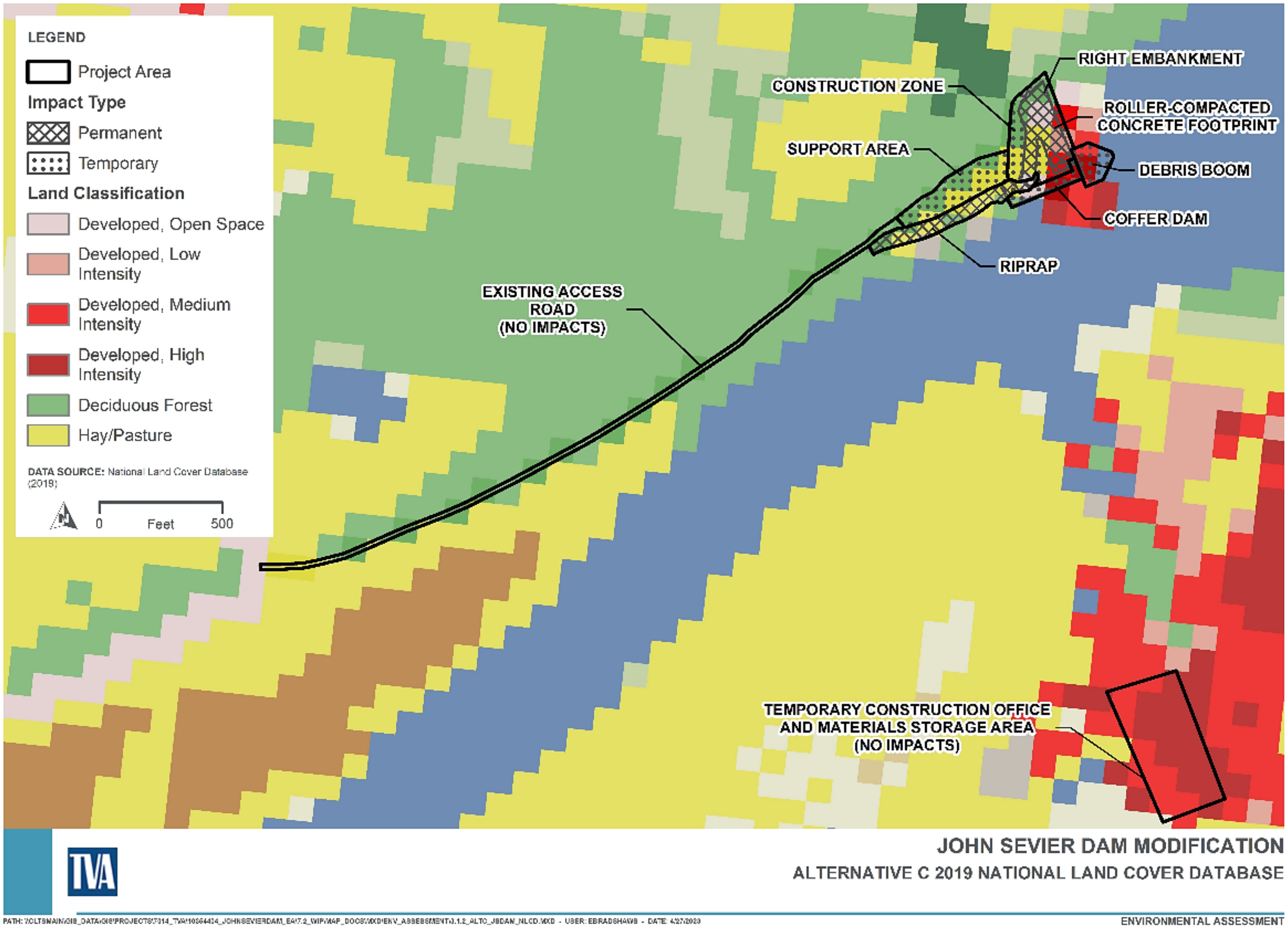


**Figure 3.1-2. Land use within the JSF Dam Project Area impacted by Alternative C (Source: NLCD 2019)**

## 3.2 Soils and Prime Farmland

### 3.2.1 Affected Environment

#### 3.2.1.1 Soils

The Project Area contains four soil types (75.1 percent) with the remainder of the Project Area containing water (24.9 percent). Soil types include, Staser silt loam, 0 to 3 percent slopes, occasionally flooded (Ss; 21.0 percent); Rock outcrop-Talbott complex, 10 to 40 percent slopes (RtE; 16.8 percent); Talbott silty clay, 12 to 25 percent slopes, severely eroded (ToD3; 0.8 percent); and Holston-Urban land complex (Hx; 36.5 percent) (USDA 2019). The Hx series soils occur south of the river on the JCC Plant site where a temporary construction office and material storage area may be used in support of the project. This additional area is contained entirely within an existing gravel lot and the underlying Hx soils would not be disturbed. The RtE series soils consist of primarily rock outcrops and minor components of Talbott and similar soils. The Ss series soils consist of very deep, well drained soils that formed in mixed alluvium. These soils occur on floodplains with slopes ranging from 0 to 3 percent and are used for growing corn, cotton, small grains, soybeans, tobacco, hay, and pasture. The ToD3 series soils consist of moderately deep, well drained soils that formed in clayey residuum weathered from limestone. These soils occur on nearly level to steep upland slopes ranging from 0 to 70 percent. These soils are used for growing corn, small grains, tobacco, soybeans, hay, and pasture (U.S. Department of Agriculture [USDA] 2022). None of the soils in the Project Area are classified as hydric.

#### 3.2.1.2 Prime Farmland

The term “prime farmland” is assigned by the USDA to land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for such uses. The Farmland Protection Policy Act (FPPA; 7 U.S. Code [U.S.C.] §4201 et seq.) requires federal agencies to consider the adverse effects of their actions on prime or unique farmland. Farmland subject to FPPA requirements does not have to be currently used for cropland. The land can be forested land, pastureland, cropland, or other land, but it cannot be water or urban built-up land. The purpose of the FPPA is “to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.” The Ss soils series is classified as prime farmland and comprises 2.1 acres of the JSF Dam Project Area (USDA 2019; see Figure 3.2-1). However, under the FPPA, since the Project Area is currently an industrial setting and has been for over 50 years, the completion of Form AD 1006 and consultation on prime farmlands is not required.

### 3.2.2 Environmental Consequences

#### 3.2.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would result in minor soil disturbance adjacent to the dam associated with operation of construction equipment and potential excavation. As the JSF dam would be maintained in its current configuration, impacts associated with maintenance activities would likely be temporary. Following maintenance, the workspace would be restored to pre-construction conditions to the extent practicable.

Regardless of source, internal erosion alone or that leads to a dam failure would have moderate impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment, could affect soils near and downstream of the JSF Dam. Further, Alternative A would result in an increased risk for large adverse environmental consequences associated with dam failure from overtopping erosion by potentially resulting in the potential downstream migration of mercury laden sediments currently present upstream of the JSF Dam. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur.

### 3.2.2.2 Alternative B

#### 3.2.2.2.1 Soils

The proposed 3.7-acre temporary laydown area for a construction office and material storage within the JCC Plant would use an existing gravel lot and would not affect soils. Based on soils data obtained from the USDA Web Soil Survey (USDA 2022), minor temporary impacts to approximately 1.5 acres of soil would occur due to disturbance during construction activities within the construction zone and in the construction support area (Figure 3.2-1). The placement of riprap along the shoreline would have a minor, permanent impact to 0.24 acre of soils. Approximately 0.75 acre of soils would also be permanently impacted due to fill within the riprap armoring footprint.

During construction, soils would be disturbed from site preparation and construction activities. Soils would be reused on-site, hauled to TVA-owned property for beneficial reuse at JCC Plant, or disposed of off-site at an appropriate existing permitted landfill, depending on test results. Disturbed soils from these activities would be stabilized and/or revegetated upon completion of the dam modification activities and mitigated through BMPs identified in Section 2.3. Cumulative effects to soils are not anticipated under Alternative B.

#### 3.2.2.2.2 Prime Farmland

Based on soils data obtained from the USDA Web Soil Survey (USDA 2022), there is approximately 2.1 acres of soil that are classified as prime farmland within the Project Area (Figure 3.2-2). Approximately 1.3 acres of prime farmland would experience minor impacts due to disturbance within the construction support area and construction zone. Minor, permanent impacts due to fill within the riprap armoring footprint and riprap shoreline stabilization area would occur to 0.78 acres of prime farmland soil. Currently, these areas are not used as farmland and are unlikely to be farmed in the future given, they are located within the industrial John Sevier Reservation. The additional 3.7-acre temporary construction building and laydown area on the JCC site south of the river is not classified as prime farmland. Within a 5-mile radius of the JSF Dam Project Area, approximately 8,650 acres (15.7 percent) have soils classified as prime farmland. Alternative B may result in a minor loss of soils classified as prime farmland; however, these soils are located within an existing industrial area and already considered converted soils. As such, no cumulative effects to prime farmland are anticipated under Alternative B.

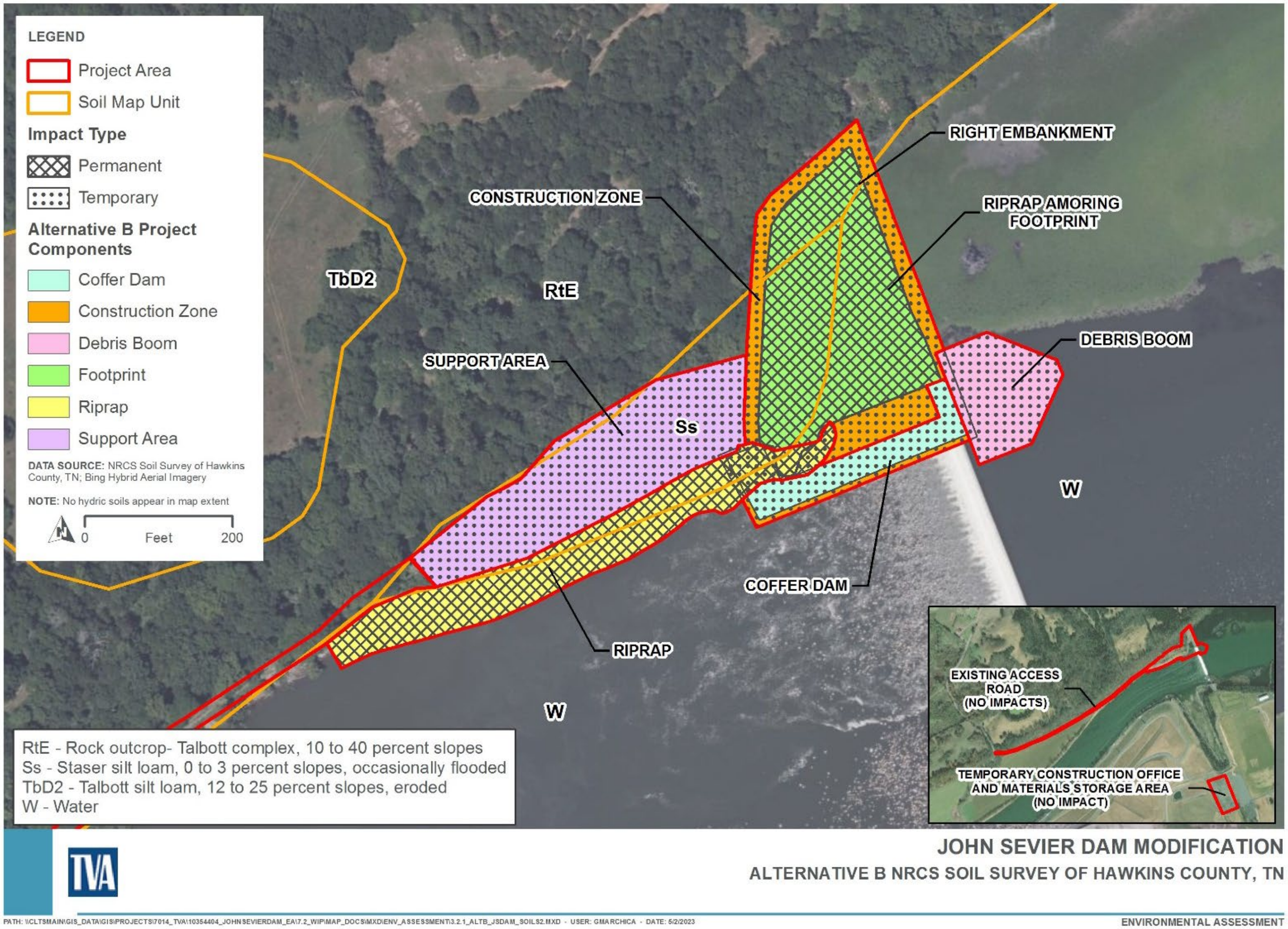


**Figure 3.2-1. Soils within the JSF Dam Project Alternative B Footprint**

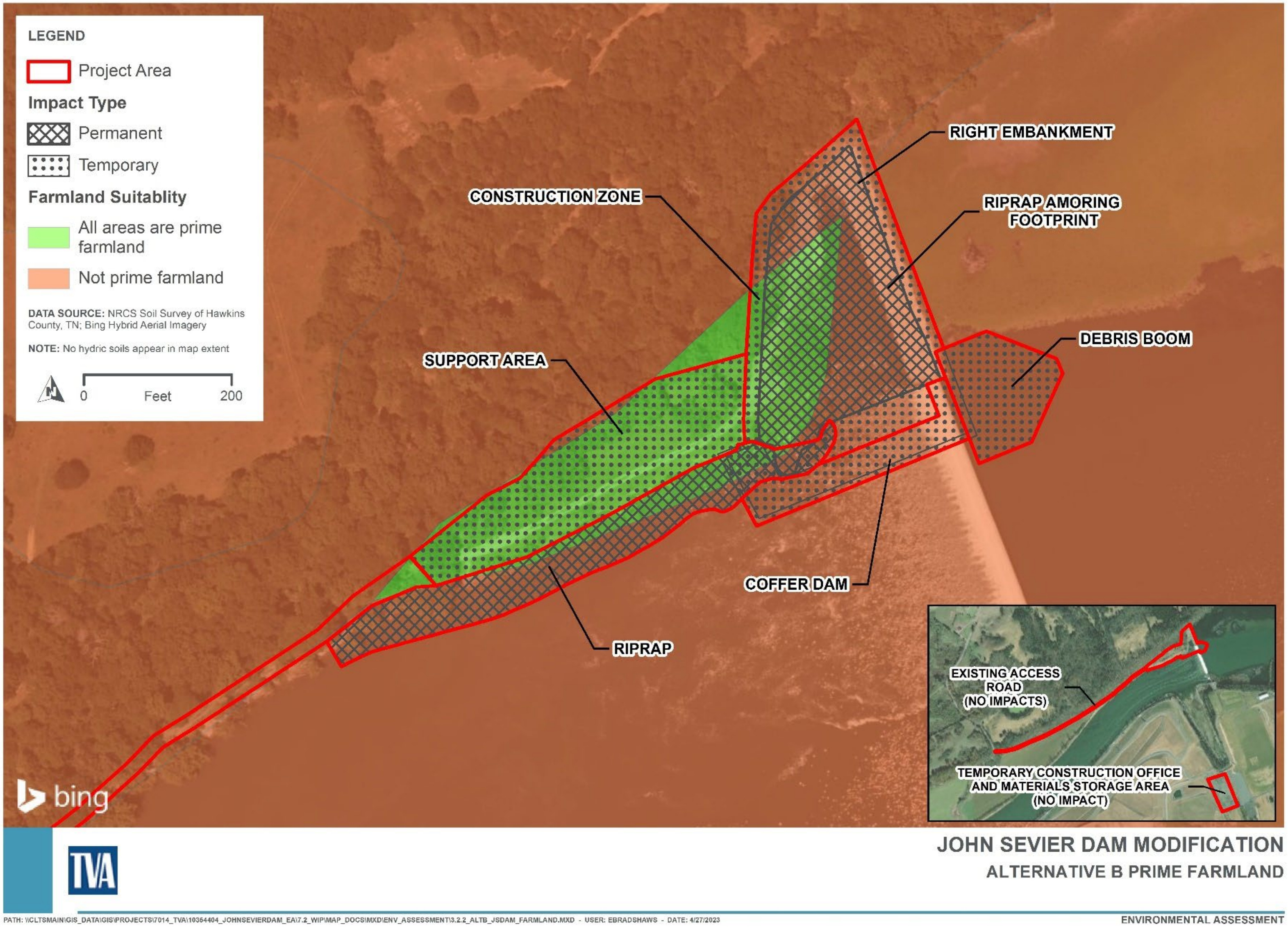


**Figure 3.2-2. Prime Farmland within the JSF Dam Project Alternative B Footprint**

### 3.2.2.3 Alternative C

#### 3.2.2.3.1 Soils

The proposed 3.7-acre temporary laydown area for a construction office and material storage within the JCC Plant would use an existing gravel lot and would not affect soils. Based on soils data obtained from the USDA Web Soil Survey (USDA 2022), there are approximately 2.5 acres of soil with the potential to be impacted by Alternative C. Approximately 1.7 acres would experience minor, temporary impacts due to disturbance within the construction support area and during activities within the construction zone (Figure 3.2-3). Minor, permanent impacts would occur to approximately 0.73 acre of soils due to fill associated with the RCC footprint and riprap shoreline stabilization.

During construction, soils would be disturbed from site preparation and construction activities, Soils would be reused on-site, hauled to TVA-owned property for beneficial reuse at JCC Plant, or disposed of off-site at an appropriate existing permitted landfill, depending on test results. Disturbed soils from these activities would be stabilized and/or revegetated upon completion of the dam modification activities and mitigated through BMPs identified in Section 2.3. Cumulative effects to soils are not anticipated under Alternative C.

#### 3.2.2.3.2 Prime Farmland

Based on soils data obtained from the USDA Web Soil Survey (USDA 2022), there are approximately 2.1 acres of prime farmland with the potential to be impacted by Alternative C. Minor, temporary impacts of approximately 1.5 acres of prime farmland would occur within the construction support area and construction zone (Figure 3.2-4). Minor, permanent impacts would occur to 0.54 acre of prime farmland within the RCC footprint and riprap shoreline stabilization area. Currently, these areas are not used as farmland and are unlikely to be farmed in the future given, they are located within the industrial John Sevier Reservation.

There would be no difference in the impacts to the additional temporary construction building and material storage area on the JCC Plant site south of the river between Alternative B and Alternative C. Alternative C may result in a minor loss of soils classified as prime farmland; however, these soils are located within an existing industrial area and already considered converted soils (Figure 3.2-4). As such, no cumulative effects to prime farmland are anticipated under Alternative C.

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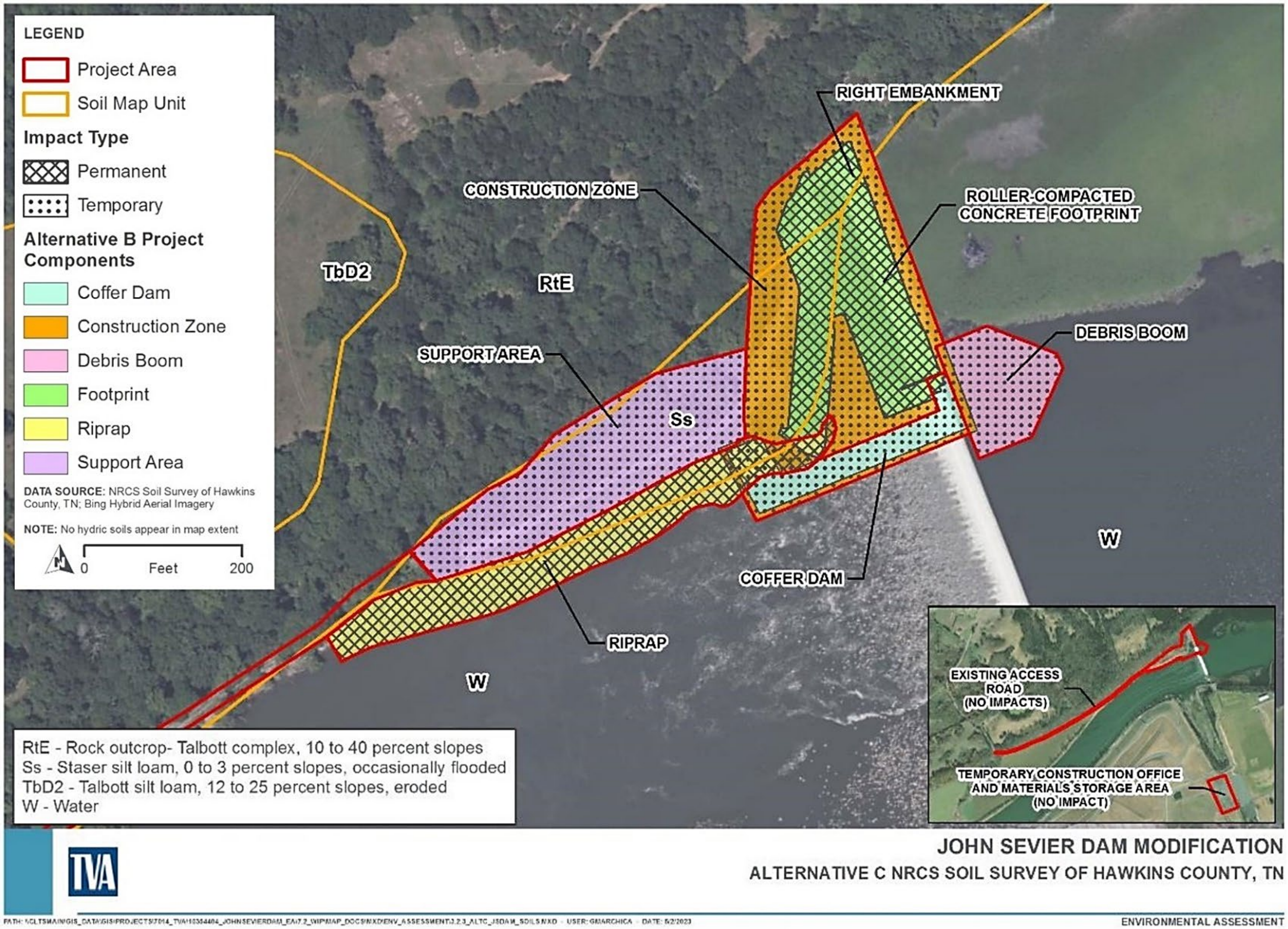


**Figure 3.2-3. Soils within the JSF Dam Project Alternative C Footprint**

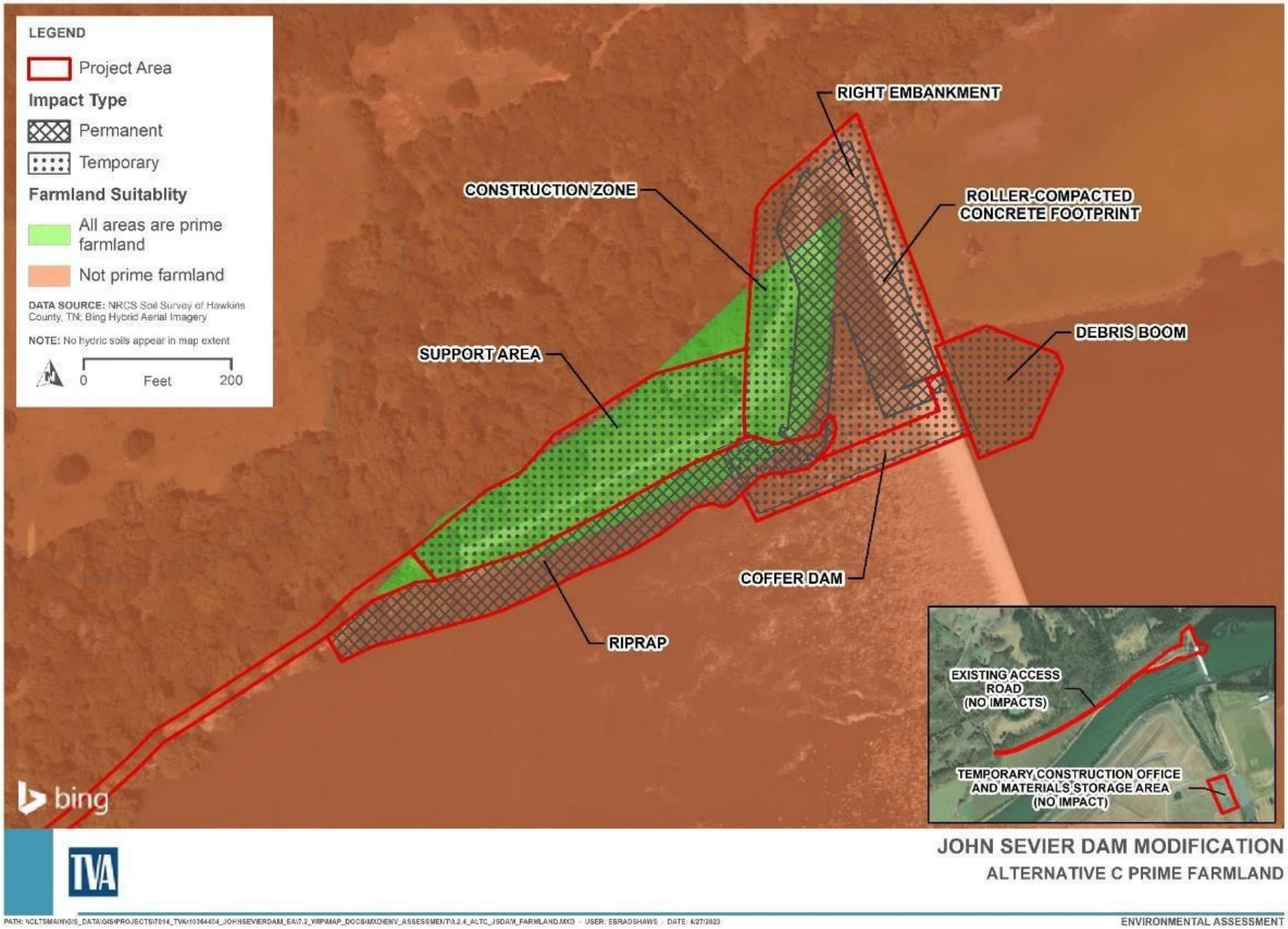


**Figure 3.2-4. Prime Farmland within the JSF Dam Project Alternative C Footprint**

## 3.3 Geology and Groundwater

### 3.3.1 Affected Environment

#### 3.3.1.1 Geology

The JSF Dam Project Area is located in the Valley and Ridge Province of the Appalachian Highlands. The region is characterized by long, narrow ridges and somewhat broader intervening valleys trending in the northeast to southwest direction. The ridges are typically parallel and have relatively level tops. They are composed of resistant sandstones and less soluble limestones and dolomites, whereas the intervening valleys are developed in more easily weathered shales and more soluble limestones (Kellberg and Benziger 1952).

Four shallow geologic units are present beneath and immediately adjacent to the Project Area. These include, in descending stratigraphic order, Holocene and Plio-Pleistocene age alluvial deposits associated with the Holston River and its tributaries, residuum derived from weathering of underlying rock, the Sevier Shale and the Lenoir Limestone, both of the latter units being of Ordovician age. The Sevier Shale underlies the southern half of the dam beneath the lower half of the concrete overfall spillway and left embankment. Lenoir Limestone is the bedrock formation directly beneath the location of the proposed Alternatives B and C construction area at the right embankment of the JSF Dam. Rodgers (1953) geologic map of East Tennessee shows Sevier Shale underneath the entire JSF Dam footprint; however, more recent, detailed maps of this area indicate that the Lenoir Limestone underlies the right embankment (Bultman 2005). The interpretation of the Lenoir Limestone underlying the right embankment is consistent with the borehole descriptions from the original construction grout curtain in this area (TVA 1954). The Sevier Shale underlying the area immediately south of the Project Area was confirmed by an Outcrop Survey conducted in January 2020 by Stantec Consulting Services, Inc (TVA 2023).

The alluvial deposits generally mantle the entire construction area for Alternatives B and C and consist of unconsolidated sandy, clayey silt with interspersed pebbles and cobbles. The alluvium occupies the present floodplains of the Cherokee Reservoir and Holston River and its tributaries where surface elevation is below about 1,100 ft. The residual soils are generally encountered beneath the alluvial deposits. Residuum primarily consists of unconsolidated silts, clays, and weathered shale, and typically exhibits weak relict structure of the parent shale bedrock (TVA 2015).

The Sevier Shale consists of dark gray to black, slightly calcareous shale with thin interbedded limestone layers ranging up to about 0.3 ft in thickness. Shales vary from unweathered to friable with some layers showing evidence of moderate weathering. Bedding attitude is variable often ranging from 40 to 90 degrees within the same core hole from which the presence of small-scale, tightly folded anticlines and synclines as commonly observed in local bedrock exposures (TVA 2015). Several cores indicated faults of unknown displacement intersecting bedding at various angles. Brecciation of thin limestone layers within a shale matrix was also observed (TVA 2010b). No borings completed within this portion of the JSF Dam have fully penetrated the Sevier Shale, but Rodgers (1953) estimated total thickness is at least 2,500 ft.

The Lenoir Limestone consists of thick to thin bedded, irregular to nodular, fine-grained, light to dark-gray limestone. Three distinct lithologies exist: (1) gray to bluish-gray argillaceous nodular limestone, weathering dark blue; (2) gray to bluish-gray, dense calcarenite that weathers blue gray; and (3) the Mosheim Member, a dense, aphanitic, gray to blue-gray limestone weathering dull gray and characteristically containing “birdseye” of calcite. The Lenoir Limestone commonly breaks into small, irregularly rounded nodules. These thin carbonate units onlap the Knox Group regional unconformity. The Lenoir Limestone and Mosheim Member, a massively bedded, light gray micritic limestone, contain the gastropod *Maclurites magnus*. Rip-up clasts of Mascot chert and dolomite from the Middle Ordovician unconformity (Knox unconformity) have been observed in the basal 2 inches of the formation (Bultman 2005).

#### 3.3.1.2 Groundwater

The Valley and Ridge province is underlain by carbonate rock aquifers in Cambrian, Ordovician, and Mississippian age rocks. In Tennessee, these aquifers underlie over half of the Valley and Ridge province and are typically present in the narrow valleys between the broad, dissected ridges of the province. The alluvium and residuum overlying the bedrock can store large quantities of water until it slowly percolates downward to recharge the bedrock aquifers (Law Engineering and Environmental Services 1994).

The first occurrence of groundwater beneath the Project Area is generally either in the basal portion of the soil overburden or upper bedrock, depending on location and time of year. Groundwater is derived from infiltration of precipitation through the soil overburden and from lateral groundwater inflow originating in upland recharge areas southeast of the Project Area. Movement of shallow groundwater is generally northwestward across the southern portion of the Project Area (i.e., south of the Cherokee Reservoir) toward the Cherokee Reservoir and Dodson Creek where it ultimately discharges (TVA 2015).

The principal aquifer[1] in the Project Area locality is the Sevier shale, consisting of thinly bedded, slightly calcareous shale with interbedded limestone layers. Faulting and jointing have provided limited access for circulating groundwater as evidenced by iron staining along joints and fractures and moderate weathering of some layers. However, the absence of thick sections of pure limestone has precluded cavity development along the southern bank of the Cherokee Reservoir. The northern bank of the Cherokee Reservoir is underlain with limestone, in which several cavities have been identified, including the karst features surrounding the JSF dam Alternatives B and C construction area. Because of limited secondary porosity and low rock matrix permeability, the upper portion of the Sevier shale in the Project Area locality is generally capable of supplying only small domestic and farm water demands (TVA 2015).

An inventory of water supply wells on the south side of the Cherokee Reservoir within 1 mile of the Project Area was performed in July 2014 (TVA 2015). Local wells were identified using the TDEC well database, discussions with the Persia Water Utility, which serves the region, and review of Hawkins County property assessments. The TDEC information included 157 well locations; however, only five private water supply wells, including one residential well (Well No. 2723) located on TVA property, were identified within 1 mile and 10 private water supply wells were identified within 2 miles of the Project Area (Figure 3.3-1). More recently, TVA completed a Water Use Survey to identify usable private water supply wells and surface water sources being used for domestic purposes within 0.5 mile of the property boundary associated with the JSF Plant. Potential well locations identified within 0.5 mile of the JSF Plant were consistent with those identified in TVA's

[1] The USGS (2021) defines a principal aquifer as a regionally extensive aquifer or aquifer system that has the potential to be used as a source of potable (drinkable) water.

2015 Final EA for the JSF Plant Deconstruction (TVA 2015). No springs were identified, and no wells are currently known to occur on TVA property.

Well sources and depths were not confirmed but given the limited selection of aquifers available locally and the limited demands typical of domestic or farm users, it is reasonable to assume most wells obtain water from the Sevier shale or possibly the alluvial deposits. No water quality data were available for these wells.

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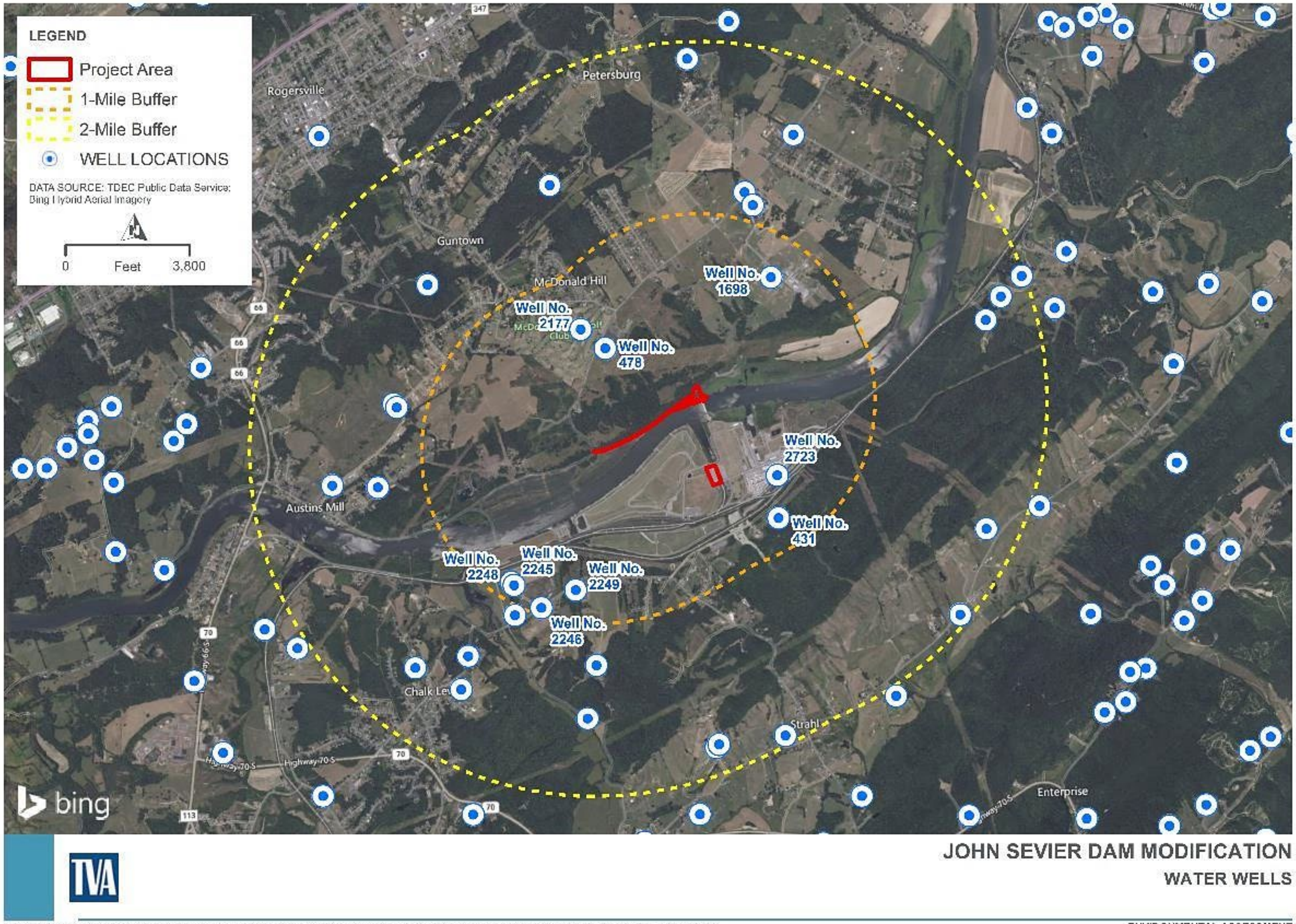


**Figure 3.3-1. Water wells in the vicinity of the JSF Dam Project Area.**

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## 3.3.2 Environmental Consequences

### 3.3.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities requiring excavation could result in minor, temporary localized impacts to geology and groundwater. As the JSF dam would be maintained in its current configuration, impacts associated with maintenance activities would likely be temporary. Following maintenance, the workspace would be restored to pre-construction conditions to the extent practicable.

Maintenance alone would not address the risks identified in the 2019 JSF Dam risk assessment. Without modifications the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows. The dam would also be at an increased risk of moderate effects from internal erosion or internal erosion-related failure of the right embankment from one or more of the following sources:

- Concentrated leakage at the interface of the right embankment and rock abutment under normal operating conditions.
- Concentrated leakage at the interface of the right embankment and concrete training wall under normal operating conditions.
- Backward erosion piping into karst features below the right embankment under normal operating conditions.

Alternative A would result in an increased risk for large adverse environmental consequences associated with dam failure from overtopping erosion. Dam failure could have a large and long-term adverse effect to groundwater near the JSF Dam by resulting in downstream migration of the mercury laden sediments currently located upstream of the JSF Dam, where they could contaminate groundwater sources through established karst features. Depending on the magnitude of dam failure and extent of downstream impacts from mercury laden sediments, cumulative effects to groundwater quality could occur.

### 3.3.2.2 Alternative B

Under Alternative B, water diversion and control methods would be implemented to manage groundwater infiltration and precipitation. These methods include the installation of dewatering wells, sumps and pits. A temporary cofferdam constructed of approximately 5,700 cy of granular material would be installed during construction. The material for the cofferdam would be obtained from a local commercial quarry. Dewatering wells are used to limit the infiltration of groundwater locally within the construction area by lowering the water table elevation. Minor impacts to the shallow groundwater aquifer would be encountered during construction operations. Water pumped from infiltration wells, sumps and pits would be directed into dewatering silt bags to capture and dry sediments. Water from the dewatering silt bags would be discharged back into the Cherokee Reservoir. Following removal of the cofferdam, the material would be reused on site, at the JCC Plant, or disposed properly at an off-site location.

To expose and prepare the downstream portion of the rockfill spillway foundation, approximately 100 ft of rock and earthen materials along the downstream bank would be excavated and rock ledges would be removed. This also includes the demolition of the existing armoring on the downstream bank and the existing right embankment slope to break up the grouted riprap. Excavation of soils and bedrock may expose erodible, weak, unstable, compressible, loose, or pervious materials (U.S. Bureau of Reclamation [USBR] 2001). To ensure a foundation of adequate strength and appropriate permeability, dental concrete would be applied by infilling joints and gouges. The exposed rock from demolished and excavated materials would also be cleaned to facilitate geologic characterization of the materials. The demolished materials would either be removed or salvaged for reuse. Minor impacts to the local geology and groundwater would result from excavating rock and earthen materials from the downstream bank. Materials would be salvaged for reuse, if possible, to minimize exposure of non-native materials to the groundwater system. If not reused, the material would be hauled offsite to the appropriate permitted landfill facility.

The installation of a grout curtain is proposed in Alternative B to address the backward erosion of piping in karst features under the right embankment. The purpose of a grout curtain under a dam is to treat existing karst features and other zones of high flow to decrease seepage under the dam, retard or stop the movement of soil through open features under the dam and reduce the uplift pressure on the base of the dam.

Subsequent to installation of the grout curtain, a concrete training wall would be installed along the left side of the proposed rockfill spillway. The training wall would have no additional affect to the underlying geology, but localized groundwater in the area of the training wall would be influenced by the installation of an impermeable surface.

The final stage of Alternative B is the construction of a rockfill spillway, in which approximately 8,000 cy of earthfill and 5,000 cy of filter material would be hauled in from an existing, permitted, off-site, borrow source. These materials would be covered by 9,300 cy of 2 feet (24 inches) in diameter riprap to stabilize the spillway. Contact grouting beneath the footprint of the entire rockfill spillway would be used to close joints, bedding planes, and potential cavities in the bedrock foundation. These activities would occur within the footprint of prior work and additional effects to the surrounding geology and groundwater are not anticipated. Overall, the effects of Alternative B would have minor impacts on geology and minor to moderate effects on the existing groundwater movement depending on the extent of karst features to be filled. Cumulative effects to geology and groundwater are not anticipated since there would be no additional activities once construction is complete.

#### 3.3.2.3 Alternative C

Under Alternative C, water diversion and control methods, excavation and foundation preparation, and grouting activities would be similar to those proposed in Alternative B. The RCC gravity dam would wrap around the outside of the training wall and tie into the existing concrete overfall spillway section of the dam. The footprint of the RCC structure would extend beyond the training wall into the Cherokee Reservoir, blocking a larger portion of the overfall spillway than Alternative B. Approximately 60 ft of rock and earthen materials along the downstream bank would be excavated. A temporary cofferdam constructed of approximately 5,700 cy of granular material would be installed during construction. The material for the cofferdam would be obtained from a local commercial quarry. Sumps, pits, and dewatering wells may also be needed to drain the work area from precipitation and groundwater infiltration. Dewatering silt bags would be employed to dry sediments; water from the dewatering bags would be discharged back into the Cherokee Reservoir. Following removal of the cofferdam, the material would be reused on site or a JCC Plant, or disposed properly off site.

The RCC would be installed within the footprint of prior work. Therefore, additional impacts to the local geology would not be anticipated. Localized groundwater in the area of the RCC would be minorly influenced by the installation of the concrete surface. After completion of the RCC, earthfill would be installed between the RCC gravity dam and the existing dam, within the footprint of the work area. Contact or consolidation grouting would be used beneath the footprint of the entire RCC gravity dam to address weak foundation zones and to close joints, bedding planes, and potential cavities in the bedrock foundation. No adverse impacts to the underlying geology or groundwater are anticipated and no cumulative effects are expected. Overall, the effects of Alternative C would have minor impacts on geology and minor to moderate effects on the existing groundwater movement depending on the extent of karst features to be filled. Cumulative effects to geology and groundwater are not anticipated since there would be no additional activities once construction is complete.

## 3.4 Surface Water and Water Quality

### 3.4.1 Affected Environment

#### 3.4.1.1 Surface Water Supply

The Project Area falls within the Holston River (10-digit Hydrologic Unit Code [HUC] 0601010401) and Cherokee Lake (HUC 0601010402) watersheds, in the Southern Shale Valleys level IV sub-ecoregion of the greater Ridge and Valley III ecoregion (Griffith et al. 1998). The Holston River is impounded at HRM 52.3 by Cherokee Dam forming the Cherokee Reservoir, an impoundment that extends upstream approximately 54 miles to the JSF Dam at HRM 106.3 (TVA 2015). The John Sevier Reservoir located on the Holston River upstream from and formed by the JSF Dam is 305 acres in size, with a surface area of 10.7 square miles and a maximum discharge of 229,000 cubic ft per second (cfs). This dam was constructed to create a detention pool in order to supply cooling water to the now-retired JSF Plant. The JCC Plant now uses the intake to withdraw water from the John Sevier Reservoir on the Holston River at an estimated current maximum withdrawal of about 11.16 cfs (7.21 million gallons per day [MGD]) (TVA 2015).

Hydrologic determinations were conducted during an August 2022 field survey, by TVA specialists meeting the requirements of a Tennessee qualified hydrologic professional, using the Tennessee Division of Water Pollution Control (Version 1.5) field forms. Field staff evaluated the geomorphology, hydrology, and biology of the Holston River within the Project Area. Aside from the Holston River, no other streams or aquatic features were documented within the Project Area (TVA 2022c).

The nearest downstream water supply intake is located on the left bank of the Cherokee Reservoir between HRMs 102 and 103, approximately 3 to 4 miles downstream of JSF Dam. The intake is operated by Persia Water Utility which serves most residents within the local area (TVA 2015). The next closest public water supply intake withdrawing water from the Cherokee Reservoir is approximately 31 miles further downstream of the dam at HRM 75.0. The intake is operated by Morristown Utility Systems and has a design capacity of 24 MGD with an average daily withdrawal of 9 MGD (TVA 2015).

#### 3.4.1.2 Surface Water Quality

Water quality on the Holston River was assessed by TDEC (TDEC 2019). TDEC classified the Holston River for six out of the eight designated uses: drinking water supply, industrial water supply, fish and aquatic life, recreation, livestock watering and wildlife, and irrigation. Based on the JSF Plant Deconstruction EA (TVA 2015), the Holston River from HRM 89.0 upstream to HRM 142.3, which includes the Holston River at HRM 106 where the JSF Dam and Project Area are located, is listed as not supporting one or more of its uses due to mercury contamination from sources outside Tennessee.

NPDES Permit number TN0005436 and NPDES Industrial Storm Water General Permit number TNR053187 cover water discharges from the JCC Plant. Drainage from the JCC Plant discharges to the Holston River at HRM 106.5 (Outfall 003) and HRM 106.2 (Outfall 008). Discharge for Outfall 003 is routed through a discharge pond prior to entering the Holston River.

TDEC's assessment and reporting on the quality of surface waters in the vicinity of the Project Area characterizes water quality within the Cherokee Reservoir and the John Sevier Reservoir as impacted and not supportive of intended water uses (TDEC 2020a, 2020b). Current and historically documented impairments to the reservoir systems adjacent to the JSF Plant include mercury impacts from legacy issues associated with atmospheric deposition from the Saltville Waste Disposal Ponds Superfund site (also referred to as the Olin Corporation site) in Smyth County, Virginia (TDEC 2014, 2020a, 2020b).

The Saltville Waste Disposal Ponds site, or Olin Corporation site, located more than 100 miles upstream of the JSF Dam in Saltville, Virginia, had historical releases of mercury that contaminated surface water and sediments of both the North Fork Holston and Holston rivers and is now a documented Superfund Site. According to a 2001-2002 USEPA investigation (USEPA 2002) of the North Fork Holston and Holston rivers, related to the Saltville Superfund Site, and an associated ecological risk assessment reported results of elevated mercury levels in sediment cores collected immediately upstream of the JSF Dam. At the time of the JSF Plant Deconstruction EA (TVA 2015), the USEPA stated that mercury in the subsurface sediments may present an unacceptable risk to human health and/or the environment if the dam is deconstructed or if other activities disturb and/or mobilize the subsurface sediment. As part of ongoing monitoring of EPA-recommended remedies at the Saltville Superfund Site, targeted environmental monitoring is performed annually to evaluate the effectiveness of prescribed remedies. Results of the 2022 5-year review by the USEPA concluded that the remedy at the Saltville Site continues to be protective of human health and environment (USEPA 2023).

Tennessee Wildlife Resources Agency (TWRA) continually monitors mercury levels in fish tissues in the Holston River (TWRA 2020) and has issued a precautionary fish consumption advisory for the South Holston River from HRM 89 to HRM 142 which includes the Holston River at HRM 106 where the JSF Dam and Project Area are located. In January 2020, TWRA expanded the advisory to include the entirety of the Cherokee Reservoir, indicating levels of mercury remain an issue (TWRA 2020). TDEC has also issued comparable fish consumption advisories for the Holston River and Cherokee Reservoir (TWRA 2020).

No Wild and Scenic Rivers or streams on the Nationwide Rivers Inventory are in the Project Area (TDEC 2022a).

### 3.4.2 Environmental Consequences

#### 3.4.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities could result in minor impacts to surface waters and surface water quality associated with temporary dewatering or use of work pads for in-water work. As the JSF dam would be maintained in its current configuration, impacts associated with maintenance activities would likely be temporary. Following maintenance, impacted surface waters would restored to pre-construction conditions to the extent practicable.

Maintenance alone would not address the risks identified in the 2019 JSF Dam risk assessment. Without modifications the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows. The dam would also be at an increased risk of moderate effects from internal erosion or internal erosion-related failure of the right embankment from one or more of the following sources:

- Concentrated leakage at the interface of the right embankment and rock abutment under normal operating conditions.
- Concentrated leakage at the interface of the right embankment and concrete training wall under normal operating conditions.
- Backward erosion piping into karst features below the right embankment under normal operating conditions.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment, could affect surface waters downstream of the JSF Dam. Further, Alternative A would result in an increased risk for moderate to large adverse environmental consequences associated with dam failure from overtopping erosion. Dam failure could have a large adverse effect to surface waters (and other environmental resources) downstream of the JSF Dam by potentially resulting in the potential downstream migration of mercury laden sediments located upstream of the JSF Dam. Depending on the magnitude of dam failure and extent of potential downstream impacts from mercury laden sediments, cumulative effects could occur.

#### 3.4.2.2 Alternative B

Under Alternative B, riprap would be placed along the right embankment of the dam to act as a rockfill spillway permanently filling an approximately 0.57-acre area of surface water based on the anticipated final structure footprint (Figure 3.4-1). An additional 0.86 acre of surface waters (Holston River), depending on water levels, would be permanently filled by the placement of up to 2,500 cy (1.5 ac-ft) of riprap along the riverbank for stabilization. The least amount of riprap possible will be used to minimize impacts to the greatest extent practicable. Minor impacts due to temporary fill would occur to the Holston River consisting of 0.29 acre for the coffer dam, 0.03 acre for the construction support area, and 0.27 acre for the construction zone (Figure 3.4-1). An additional 0.43 acre would be temporarily impacted in John Sevier Reservoir due to placement of a debris boom during construction activities. Impacts associated with the demolition, excavation, and foundation preparation activities, which may include construction stormwater runoff and upland dewatering of work areas are not anticipated to the Cherokee Reservoir. Adherence to construction stormwater permits would be maintained to limit surface water runoff. Appropriate BMPs would be installed around excavation areas related to foundation preparation to minimize off-site transport of sediments.

Adequate erosion controls would be installed and maintained until after project completion and the area has been stabilized. All disturbed areas would be revegetated or otherwise stabilized upon completion of construction. There are no discharge points associated with the existing dam. Therefore, minor alterations to surface water resources would be anticipated to occur from the construction of the riprap embankment and spillway modification within the Alternative B construction area. TVA would comply with permit requirements and implement BMPs. Further, Alternative B would not substantially alter the surface water hydrology, quantity, or quality beyond alternations that have occurred because of the existing dam structure.

Given the quantity of permanent surface water fills anticipated from construction and that all work would be completed with adherence to applicable regulations and permits, moderate impacts to surface waters would occur. No additional work or impacts to surface waters are expected following completion of the Project, therefore cumulative effects are not anticipated.

#### 3.4.2.3 Alternative C

Under Alternative C, minor impacts would occur to approximately 0.66 acre of the Holston River as a result of construction activities and the temporary placement of fill for the coffer dam, and disturbance within the construction zone and support area.(Figure 3.4-2). An additional 0.43 acre would be temporarily impacted in John Sevier Reservoir due to placement of a debris boom during construction activities. A total of approximately 1.4 acre of surface waters would be permanently filled from construction activities for the RCC gravity dam and stabilization of the shoreline with riprap. Appropriate BMPs would be installed around excavation areas related to foundation preparation to minimize off-site transport of sediments. Alternative C would require a smaller area of excavation in the downstream floodplain than required for Alternative B; and would therefore reduce the potential for sediment discharges to the Cherokee Reservoir. Further, Alternative C would not substantially alter the surface water hydrology, quantity, or quality beyond alternations that have occurred because of the existing dam structure.

Given the quantity of permanent surface water fills anticipated from construction and that all work would be completed with adherence to applicable regulations and permits, moderate impacts to surface water would occur. No additional work or impacts to surface waters are expected following completion of the Project, therefore cumulative effects are not anticipated.

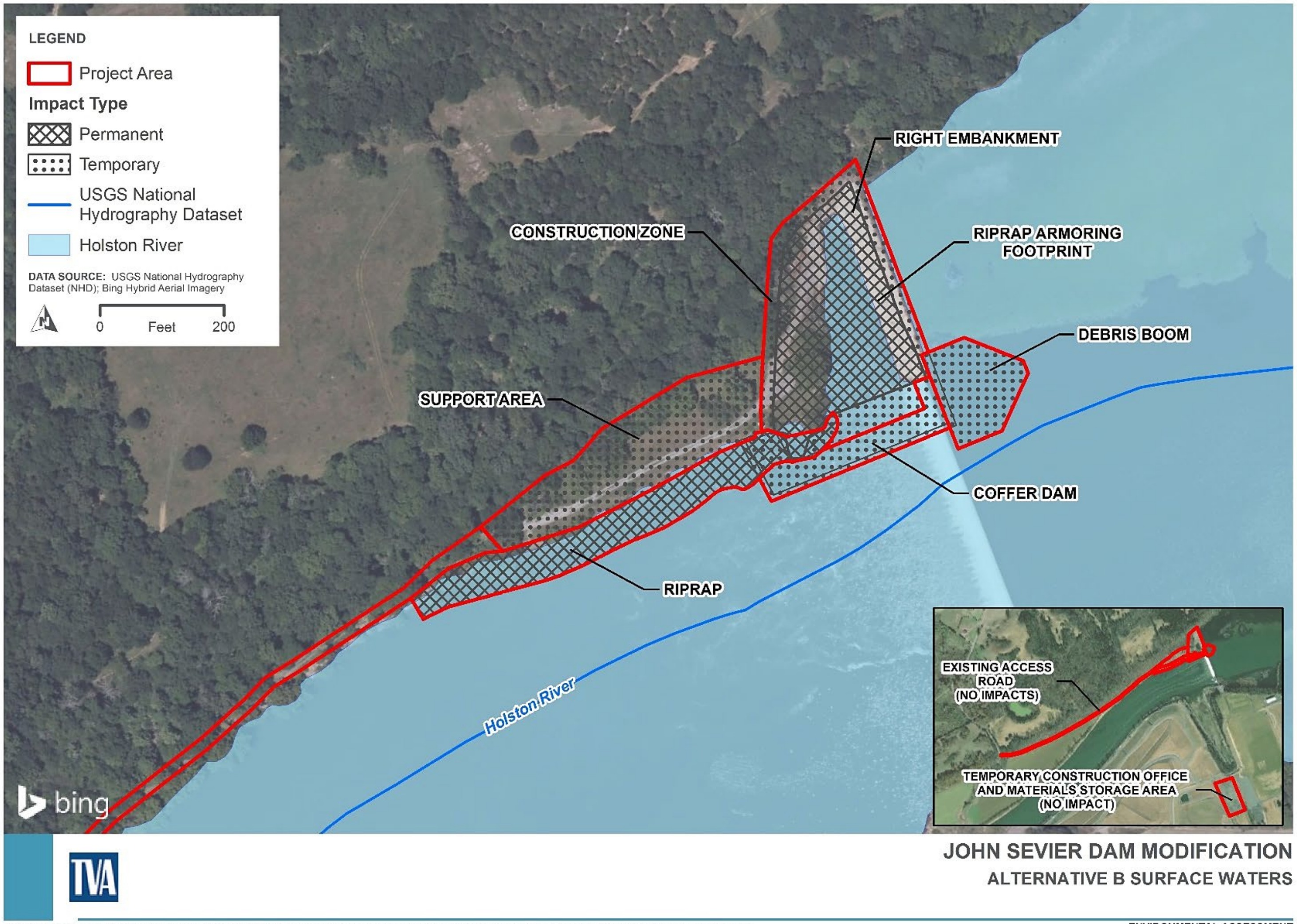


**Figure 3.4-1. Surface waters within the JSF Dam Project Area impacted under Alternative B**

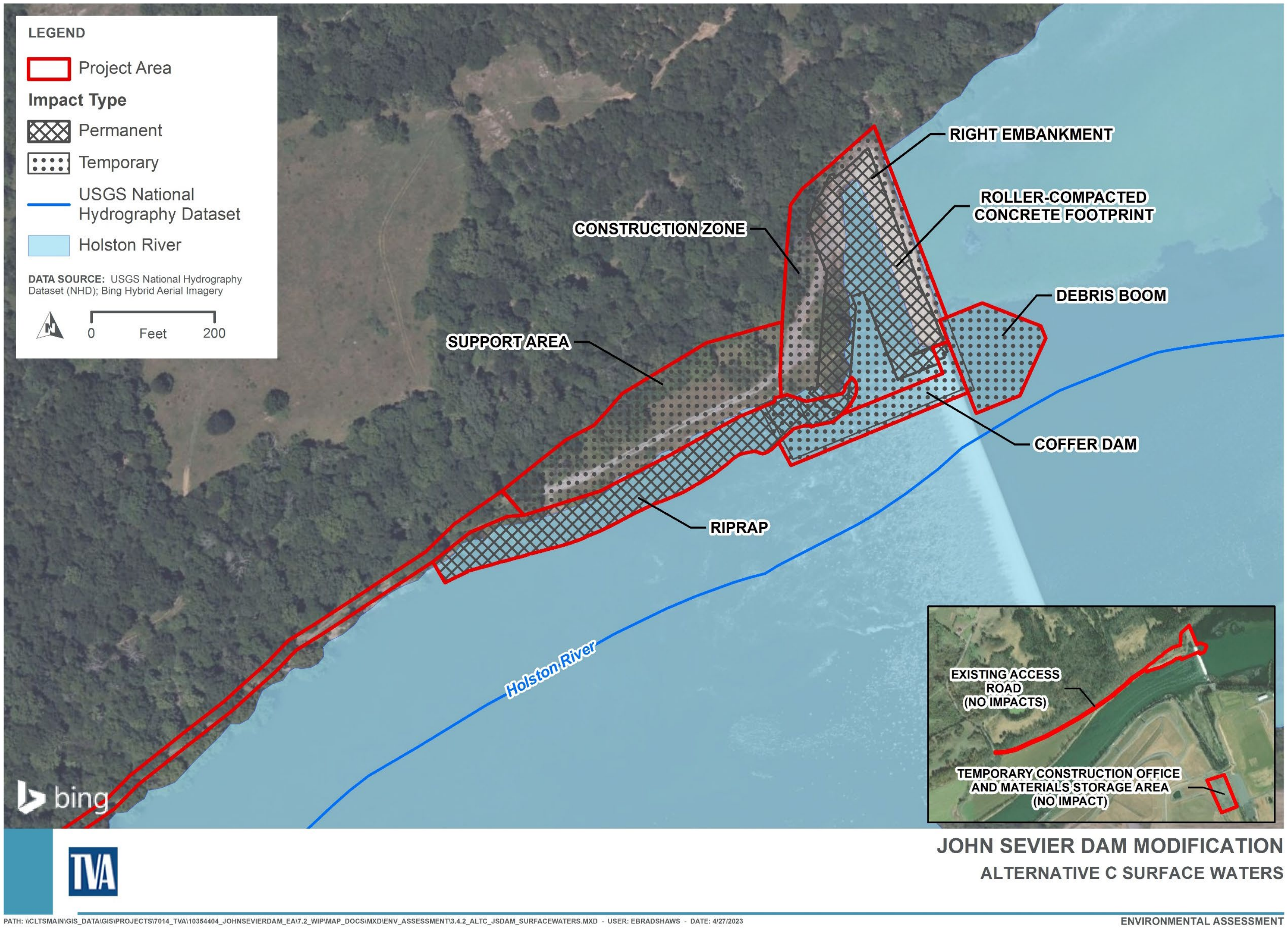


**Figure 3.4-2. Surface waters within the JSF Dam Project Area impacted under Alternative C**

## 3.5 Floodplains

### 3.5.1 Affected Environment

A floodplain is the relatively level land area along a stream or river that is subject to periodic flooding. The area subject to a 1 percent chance of flooding in any given year is normally called the 100-year floodplain. The area subject to a 0.2-percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in the floodplain to ensure that the Project is consistent with the requirements of Executive Order (EO) 11988, Floodplain Management.

TVA reservoirs have either power storage or flood storage or both. Power storage is allocated to a range of elevations and water occupying space in that range is used to generate electric power through a dam's hydroturbines. Flood storage is allocated to a different range of elevations and water occupying space within that range is used to store flood water during a flood or high-flow rain event. The flood storage zone on Cherokee Reservoir extends from 1,045.0 to 1,082.9 ft, which is the January 1 Flood Guide elevation to the 500-year flood elevation; and the power storage zone extends from 980.0 to 1,071.0 ft, which is the minimum elevation of power generation to the June 1 Flood Guide elevation.

Hawkins County FEMA Flood Insurance Rate Map panels 47073C0238D and 47073C0239D, both effective July 3, 2006, identify the Holston River floodplains both upstream and downstream of the JSF Dam as Zone A. According to the National Flood Insurance Program, Zone A floodplains are floodplains for which flood elevations have not been determined; however, TVA computed flood elevations for the Holston River upstream and downstream of JSF Dam in 1987 using HEC-2. The 100- and 500-year flood elevations for this location are shown in Table 3.5-1. The elevation of the crest of JSF Dam is 1,085 ft. Therefore, the dam would be under about four feet of water in a 100-year flood, and under about six feet of water in a 500-year flood.

Diagrams of the JSF dam are shown in Figures 1 through 9 of the John Sevier Dam Water Control Manual (TVA 2002). Based on the elevations illustrated in Figure 2 of the manual, the top of the detention dam on the left bank is elevation 1,106.08 ft, which is about four feet higher than the inflow design flood headwater elevation of 1,102 ft (TVA 2002). The design flood tailwater elevation is 1,100 ft (TVA 2002). The spillway and right bank of the dam were designed to be overtopped (TVA 2002).

Four coal combustion residuals (CCR) management areas are present on the left downstream bank of the Holston River, southeast of the former John Sevier Fossil Plant: Dry Fly Ash Stack (DFAS), Ash Disposal Area J (ADJ), Bottom Ash Pond (BAP), and Highway 70 Borrow Area (HBA). TVA conducted the Final Ash Impoundment Closure Programmatic EIS, Part II – Site-Specific NEPA Review: John Sevier Fossil Plant (TVA 2016). The 2016 review addressed closure of the Bottom Ash Impoundment at John Sevier. Because they were already closed, the DFAS, HBA and ADJ were outside the scope of that review (TVA 2016).

In response to a TDEC Order (No. OGC15-0177), TVA's 2018 Environmental Investigation Plan for the JSF CCR management areas was developed, and then implemented between 2019 and 2021. Results of the investigation were evaluated along with information collected in prior investigations and other ongoing regulatory monitoring programs conducted between the 1970s and 2022, and then synthesized in TVA's Environmental Assessment Report (EAR) of the John Sevier Fossil (TVA 2023). The EAR describes the extent of any surface stream water, sediment, and groundwater contamination documented during these evaluations of the JSF Plant CCR management areas. The EAR indicated impacts to limited onsite groundwater areas, and that the JSF CCR management areas have had minimal, if any, potential impacts to sediment and stream water quality (TVA 2023).

TVA Flood Risk interpolated approximate crest elevations of the dikes of the four CCR management areas from Appendix D of the John Sevier Environmental Assessment Report (TVA 2023). River miles and flood elevations at the upstream and downstream limits of these four areas, as well as the approximate crest elevations of the CCR dikes are shown in Table 3.5-1. A comparison of these data indicate that the dikes of the four CCR areas are of sufficient heights to remain fully protected from flooding under the proposed 100-year and 500-year flood scenarios.

**Table 3.5-1. Holston River 100-year and 500-year Flood Elevations (Feet) for the Upstream and Downstream Limits (River Mile) of CCR Management Areas on the JSF Reservation, Hawkins County, Tennessee**

| Description | Holston River Mile | Flood Elevations (feet)[1] | | CCR Management Areas Crest Elevations[2] (feet) |
|---|---|---|---|---|
| | | 100-Year | 500-Year | |
| Downstream Limit of Ash Disposal Area J | 104.9 | 1,075.6 | 1,080.2 | Protected by riprap and a clay dike to at least approximately EL 1,107 |
| Upstream Limit of Ash Disposal Area J | 105.2 | 1,076.3 | 1,080.8 | Protected by riprap and a clay dike to at least approximately EL 1,110 |
| Highway 70 Borrow Area/Bottom Ash Pond | 105.3/Polly Branch Mile 0.2 | 1,076.5 | 1,081.0 | Natural ground elevation above EL 1,100 (both units) |
| Downstream Limit of Bottom Ash Pond | 105.6 | 1,077.2 | 1,081.6 | Protected by a clay dike to at least approximately EL 1,130 |
| Upstream Limit of Bottom Ash Pond | 106.1 | 1,078.0 | 1,082.3 | Protected by a clay dike to at least approximately EL 1,140 |
| Downstream Limit of Dry Fly Ash Stack | 105.4 | 1,076.7 | 1,081.2 | Protected by riprap and a clay dike to at least approximately EL 1,100 |
| Upstream Limit of Dry Fly Ash Stack | 106.1 | 1,078.0 | 1,082.3 | Protected by a clay dike to at least approximately EL 1,100 |
| Downstream Face John Sevier Det. Dam | 106.3 | 1,078.5 | 1,082.9 | n/a |
| Upstream Face John Sevier Det. Dam | 106.3 | 1,089.2 | 1,091.1 | n/a |

[1] Flood elevations referenced to National Geodetic Vertical Datum 1929.

[2] CCR elevations referenced to NAVD 1988 and interpolated from Appendix D of TVA 2023.

[3] Subtract 0.5 foot from NGVD 1929 elevations to get NAVD 1988 elevations at JSF (NOAA 2023).

### 3.5.2 Environmental Consequences

TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "…to avoid to the extent possible the temporary and permanent adverse effects associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (U.S. Water Resources Council 1978). The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent government policy against such development under most circumstances. The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

EO 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, was reinstated by President Joe Biden in May 2021. However, implementation of EO 13690 is still in development at the national level. TVA is working with other federal agencies to develop consistent implementing plans for these EO requirements and may update its implementing plan when federal guidance is finalized. TVA currently incorporates floodplain analyses with respect to the 500-year floodplain in alignment with EO 13690, in addition to EO 11988.

#### 3.5.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Temporary disturbance adjacent to the dam, such as excavation and temporary fill in surface waters may result in minor impacts to floodplains. As the JSF dam would be maintained in its current configuration, impacts associated with maintenance activities would likely be temporary.

The top of the detention dam on the left bank is elevation 1,106.08 ft, which is about four feet higher than the inflow design flood elevation of 1,102 ft. The spillway and right bank of the dam were designed to be overtopped (TVA 2002). The spillway elevation is 1,080 ft, and the elevation of the right embankment is 1,085 ft (TVA 2002). The possibility of overflow on the left embankment is less than the possibility of overflow on the right embankment. In the extremely unlikely event that JSF Dam overtops, the left embankment would overtop last, and only if water surface elevations exceed 1,106.08 ft, which is well above both the 500-year flood elevation of 1,091.1 ft and the inflow design flood headwater elevation of 1,102 ft. The inflow design flood tailwater elevation 1,100 ft matches the upper limit of dike elevations of HAB and DFAS, is about seven feet lower than the upper limit of the ADJ dike elevations, and is about 20 feet lower than the upper limit of the BAP dike elevations provided in Table 3.5-1.

Alternative A would result in an increased risk for large adverse environmental consequences associated with dam failure from overtopping erosion. Dam failure could have a large impact due to the migration of sediment downstream of the dam that would potentially affect the flood storage capacity of Cherokee Reservoir or increase flood elevations in Cherokee Reservoir, or both. Depending on the magnitude of dam failure and extent of potential downstream impacts from sediments, cumulative effects could occur.

#### 3.5.2.2 Alternative B

Based on terrain data available to TVA, the proposed temporary laydown area for the construction office and material storage area located south of the Cherokee Reservoir is located on ground that exceeds an elevation of 1,100 ft, which is well above the 500-year flood elevation 1,091.1 ft and the 100-year flood elevation 1,089.2 ft. The construction area where dam construction would occur is within the 100-year floodplain (Figure 3.5-1). As stated in Section 2.1.2.4, the dam modifications would result in net fill of about 14,650 cy (9.1 acre-ft) of earthen backfill, filter material and riprap armoring within the 100-year floodplain of the Holston River and Cherokee Reservoir flood storage zone.

Modifying the JSF Dam is a functionally dependent use of the 100-year floodplain, as the dam is located within the Holston River floodplain. There is no practicable alternative to placing a coffer dam and fill in the floodplain, as the purpose of the proposed action is to fortify the right embankment and spillway and ensure the continued safe operation of JSF Dam. To minimize adverse impacts, the least amount of fill practicable would be used to achieve project objectives, and any excess excavated material would be stored or disposed of outside 100-year floodplains. TVA conducted a hydraulic study of the impacts to Holston River flood elevations due to Alternative B and will provide the study findings to the Hawkins County Floodplain Administrator for the community's records (Barge Design Solutions 2022). The study indicates that flood elevations upstream of JSF Dam would increase less than 1.0 ft, which would be consistent with the National Flood Insurance Program and EO 11988, and that the constructed structure would have negligible impact to Cherokee Reservoir flood storage. Assuming a hypothetical one-foot rise in 100- and 500-year flood elevations post-construction as a worst-case scenario, 100- and 500-year flood elevations would still be well below the crest elevations of the four CCR management areas (Table 3.5-1).

The existing access road would be improved to accommodate construction traffic. As part of the improvements, up to 1.5 ac-ft (2,500 cy) of riprap would be placed within the 100-year floodplain and Cherokee Reservoir flood control storage zone to stabilize the shoreline adjacent to the access road and construction support area. There is no practicable alternative to placing this quantity of riprap because of the length of shoreline to stabilize. To minimize adverse impacts, any road improvements would be done in a manner such that upstream flood elevations would increase less than 1.0 ft, and the least amount of riprap would be used to stabilize the shoreline for the access road. Also, standard BMPs would be employed to minimize adverse effects during construction activities. Therefore, the road improvements would be consistent with EO 11988 and the TVA flood control storage loss guideline (18 CFR §1304.407).

The temporary construction support area near the downstream face of JSF Dam would not be considered a repetitive action in the 100-year floodplain. There is no practicable alternative to locating the support area in the floodplain because the floodplain is the area closest to the construction area, and other potential sites required cutting of trees, or land unsuitable due to ground saturation, terrain, or topography challenges and constraints. The construction zone surrounding the final project footprint would also result in temporary impacts to the 100-year floodplain, as well as the temporary placement of the debris boom upstream of the dam. These temporary activities would result in a total of approximately 2.5 acres of minor, temporary floodplain impacts due to disturbance.

To minimize adverse impacts, the laydown area would be returned as close to pre-construction conditions as practicable following completion of the Project. To further minimize adverse impacts, an evacuation plan would be created for removal of flood-damageable equipment and materials from the floodplain in the event of a flood or high-flow event. If used, the additional temporary material storage area across the river from the Alternative B construction area is located outside the 100-year floodplain, would be accessed via existing roadways in and around the JCC Plant, and would not require vegetation clearing or ground disturbance. With implementation of BMPs and minimization and mitigation efforts as described in Section 2.3, Alternative B would result in minor impacts on floodplains and their natural and beneficial values. No additional fill to the 100-year floodplain resulting in effects to flood elevations are expected following construction of the project, therefore cumulative effects are not anticipated.

#### 3.5.2.3 Alternative C

Alternative C would employ the same excavation, road improvement, temporary support/laydown, shoreline stabilization, disposal, additional temporary laydown area for a construction office and material storage, and hydraulic study activities as described in Alternative B, except a net fill of about 11.1 ac-ft (17,950 cy) would be placed under Alternative C for the dam modification rather than Alternative B's 9.1 ac-ft of net fill (Figure 3.5-2). Therefore, the impacts of Alternative C would be comparable to those under Alternative B. The construction support area, construction zone surrounding the final project footprint, and placement of the debris boom upstream of the dam would result in minor, temporary impacts to the floodplain primarily due to disturbance, totaling approximately 2.8 acres of temporary floodplain impacts due to disturbance and temporary fill. The hydraulic study mentioned in Section 3.5.2.2 evaluated the Alternative C design with the same results: flood elevations upstream of JSF Dam would increase less than 1.0 ft, which would be consistent with the National Flood Insurance Program and EO 11988, and the constructed structure would have negligible impact to Cherokee Reservoir flood storage. With implementation of BMPs and minimization and mitigation efforts as described in Section 2.3, Alternative C would result in minor impacts on floodplains and their natural and beneficial values. No additional fill to the 100-year floodplain resulting in effects to flood elevations are expected following construction of the project, therefore cumulative effects are not anticipated.

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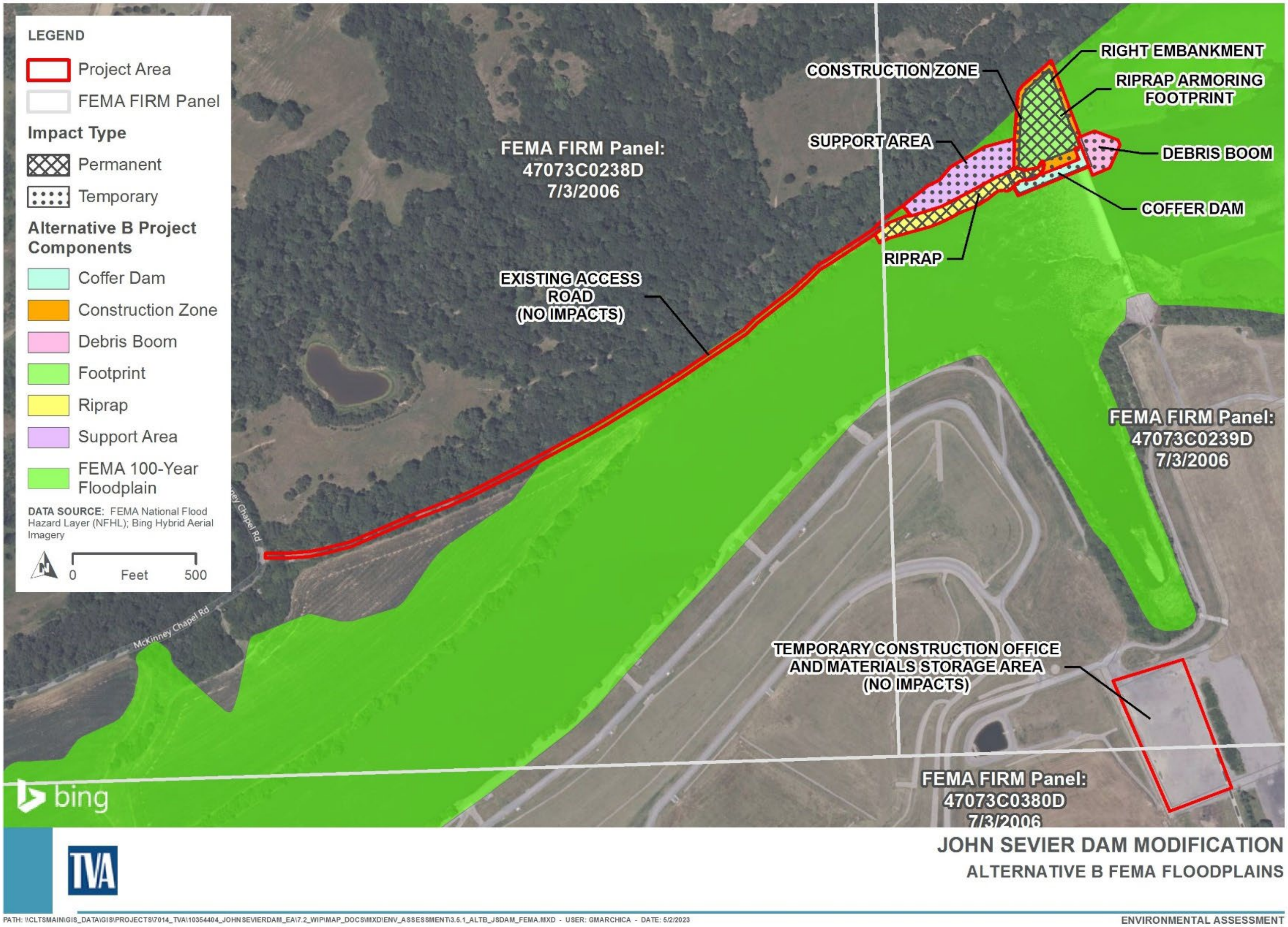


**Figure 3.5-1. Floodplains within the JSF Dam Project Area under Alternative B**

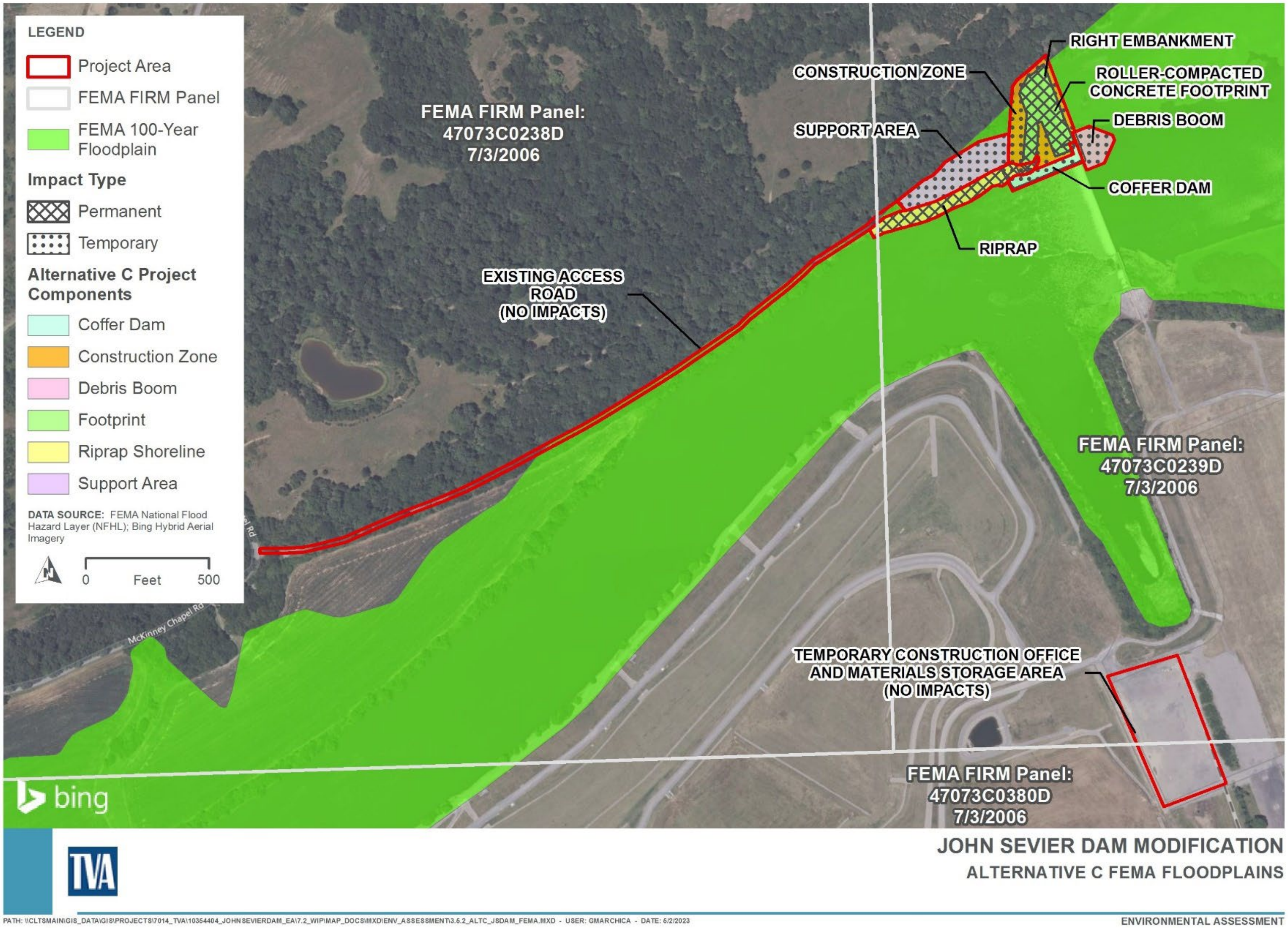


**Figure 3.5-2. Floodplains within the JSF Dam Project Area under Alternative C**

## 3.6 Wetlands

### 3.6.1 Affected Environment

Wetlands are generally defined as areas that have become inundated or saturated by surface or groundwater such that vegetation adapted to saturated soil conditions is prevalent. Examples include bottomland forests, swamps, wet meadows, isolated depressions, and fringe wetlands along the edges of watercourses and impoundments. Wetlands provide many societal benefits including toxin absorption and sediment retention for improved downstream water quality, storm water attenuation for flood control, shoreline buffering for erosion protection, and provision of fish and wildlife habitat for commercial, recreational, and conservation purposes. In East Tennessee, wetlands are typically associated with low-lying, poorly drained areas, floodplains and riparian zones, and reservoir shorelines.

Activities in wetlands are regulated under Section 401 and 404 of the CWA and are addressed by EO 11990 (Protection of Wetlands). Section 401 requires a water quality certification by the state for projects permitted by the federal government. Section 404 implementation requires activities resulting in the discharge of dredge or fill into Waters of the U.S. (WOTUS) to be authorized through a Nationwide General Permit or Individual Permit issued by the USACE. EO 11990 requires federal agencies to minimize wetland destruction, loss, or degradation, and preserve and enhance natural and beneficial wetland values, while carrying out agency responsibilities.

The Project Area is located in the Cherokee Lake watershed and within the Southern Shale Valleys Ecoregion IV, a subdivision of the Ridge and Valley Ecoregion III, which occurs between the Blue Ridge Mountains to the east and the Cumberland Plateau to the west (Griffith et al. 1998). Within this watershed, wetlands comprise less than 0.3 percent of overall land use (TDEC 2007). Soils within the proposed Project Area are classified as moderately well-draining to well-draining soils and are generally not hydric (see Section 3.2). The Cherokee Reservoir in the Project Area is classified as a lacustrine system (L1UBHh), impounded, deep-water habitat with unconsolidated bottom, by the National Wetlands Inventory.

Wetland determinations were performed according to USACE, Eastern Mountains and Piedmont Regional standards (Environmental Laboratory 1987; USACE 2012), which require documentation of hydrophytic vegetation (Lichvar et al. 2016), hydric soil, and wetland hydrology.

A field survey was conducted on August 4, 2022, of the proposed access road, construction support area, and Project Area near the base of the dam (TVA 2022c). No wetlands were identified in these areas. No hydric soil, wetland hydrology, or hydrophytic vegetation were identified in combination during the field survey. A wetland complex was identified immediately upstream of the dam beyond the limits of the Project Area.

### 3.6.2 Environmental Consequences

#### 3.6.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would result in minor land disturbance adjacent to the dam to allow for operation of construction equipment. No wetlands are located adjacent to the JSF dam; therefore, maintenance activities would not affect wetlands.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment, could result in the potential release of mercury laden sediments downstream of the dam, which could result in indirect moderate adverse impacts to downstream wetlands. Additionally, dam failure would result in reduced hydrology to wetland complexes upstream of the dam, resulting in indirect moderate adverse impacts to wetlands. Depending on the magnitude of dam failure including the amount of time for repair and remediation, and extent of potential downstream impacts from sediments, cumulative effects could occur.

#### 3.6.2.2 Alternative B

Under Alternative B, additional riprap would be installed along the right embankment of the dam to act as a rockfill spillway. No wetlands were identified within the Project Area and the proposed construction activities are not expected to have an impact on upstream water levels or wetlands. BMPs would be implemented during construction to reduce potential indirect impacts from sedimentation to downstream wetlands (TVA 2022b). Therefore, there are no direct impacts to wetlands from Alternative B, and cumulative effects are not anticipated.

#### 3.6.2.3 Alternative C

Under Alternative C, a RCC gravity dam would be constructed downstream of the existing embankment that would include natural earthen backfill between the two structures and would be tied into the downstream face of the right embankment. No wetlands were identified in the Project Area and proposed construction activities are not expected to impact upstream water levels or wetlands. BMPs would be implemented during construction to reduce potential indirect impacts from sedimentation to downstream wetlands (TVA 2022b). Therefore, there are no direct impacts to wetlands from Alternative C, and no cumulative effects are expected.

## 3.7 Vegetation

### 3.7.1 Affected Environment

The Project Area falls within the Southern Shale Valleys Ecoregion, a subdivision of the Ridge and Valley Ecoregion (Griffith et al. 1988). The Ridge and Valley Ecoregion occurs between the Blue Ridge Mountains to the east and the Cumberland Plateau to the west and is a relatively low-lying region made up of roughly parallel ridges and valleys that were formed through extreme folding and faulting events in past geologic time. The Southern Shale Valleys Ecoregion consists of lowlands, rolling valleys, and slopes and hills with forested and crop lands. Historical accounts of forest composition in the Ridge and Valley Ecoregion of eastern Tennessee include chestnut, chestnut oak, black oak, and yellow poplar (Martin et al.1993).

JSF Dam is located approximately 0.5 mile from the Southern Limestone/Dolomite Valleys and Low Rolling Hills Ecoregion, which is also a subdivision of the Ridge and Valley Ecoregion (Griffith et al. 1998). Landforms in this ecoregion are mostly undulating valleys and rounded ridges and hills, with many caves and springs. Soils vary in their productivity and land cover includes oak-hickory and oak-pine forests, pastures, intensive agriculture, and urban and industrial areas.

A desktop survey was performed using aerial and topographic imagery to describe vegetation communities within the construction zone, support/laydown, coffer dam, and final structure footprint areas (i.e., access road and temporary construction office and material storage area not included). These areas consist of approximately 1.5 acres of vegetated habitat comprising approximately 0.8 acres of deciduous forest and about 0.7 acre of herbaceous grassland, ruderal, or early successional habitat. The proposed 3.7-acre temporary construction office and material storage area is an existing gravel lot and has been permanently cleared of vegetation. The existing access road is bordered by deciduous forest and herbaceous grassland, ruderal, or early successional habitat.

The portion of the Project Area located at the right embankment of the dam was heavily disturbed by the construction of the dam. This area is now dominated by early successional vegetation, primarily non-native and native weeds and deciduous trees surrounding the dam (TVA 2022c). These areas possess little conservation value, and the plant communities found there are common and well represented throughout the region.

## 3.7.2 Environmental Consequences

### 3.7.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would result in minor impacts associated with removal of vegetation to allow for operation of construction equipment. As the JSF dam would be maintained in its current configuration, impacts associated with maintenance activities would likely be temporary; however, impacts may include conversion of forested habitat to open, herbaceous habitat.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment, could result in sediment deposition and increased erosion that could have moderate impacts to vegetation communities downstream. Depending on the magnitude of dam failure and extent of potential downstream impacts sediments or erosion, cumulative effects could occur.

### 3.7.2.2 Alternative B

Alternative B would not result in appreciable impacts to the terrestrial ecology of the region but would result in alteration of vegetation currently on the property, either temporarily from construction activities or permanently from construction and final footprint of the riprap armored rockfill spillway. Alternative B would result in minor permanent impacts to approximately 0.21 acre of deciduous trees and 0.08 acre of herbaceous fields from the construction of the final structure. Supporting construction activities would result in temporary direct impacts to approximately 0.52 acre of deciduous trees and 0.69 acre of herbaceous fields (Figure 3.7-1).

The herbaceous fields and deciduous trees located within the Alternative B construction area consist primarily of non-native species and have little to no conservation value. Neither the open fields containing herbaceous vegetation, nor the row of deciduous trees support unique natural plant communities (TVA 2022c). Most of the trees removed would be on the margin of a forested area and therefore would not result in fragmentation. The early successional habitat is common and well represented throughout the region. Therefore, Alternative B is expected to have minor impacts to vegetation communities. Much of the area will be allowed to regenerate following construction and additional work is not anticipated, therefore cumulative effects are not expected.

#### 3.7.2.3 Alternative C

Alternative C would not result in appreciable impacts to the terrestrial ecology of the region, but the action would result in alteration of vegetation currently on the property either temporarily from construction activities or permanently from construction of the final structure. Alternative C would result in minor permanent impacts to approximately 0.15 acre of deciduous trees and approximately 0.03 acre of herbaceous fields from the construction of the final structure. Supporting construction activities would result in minor impacts to 0.59 acre of deciduous trees and 0.75 acre of herbaceous fields (Figure 3.7-2). The herbaceous fields and deciduous trees located within the Alternative C construction area consist primarily of non-native species and have little to no conservation value. Neither the open fields containing herbaceous vegetation, nor the row of deciduous trees support unique natural plant communities (TVA 2022c). Most of the trees removed would be on the margin of a forested area and therefore would not result in fragmentation. The early successional habitat is common and well represented throughout the region. Therefore, Alternative C is expected to have minor impacts to vegetation communities. Much of the area will be allowed to regenerate following construction and additional work is not anticipated, therefore cumulative effects are not expected.

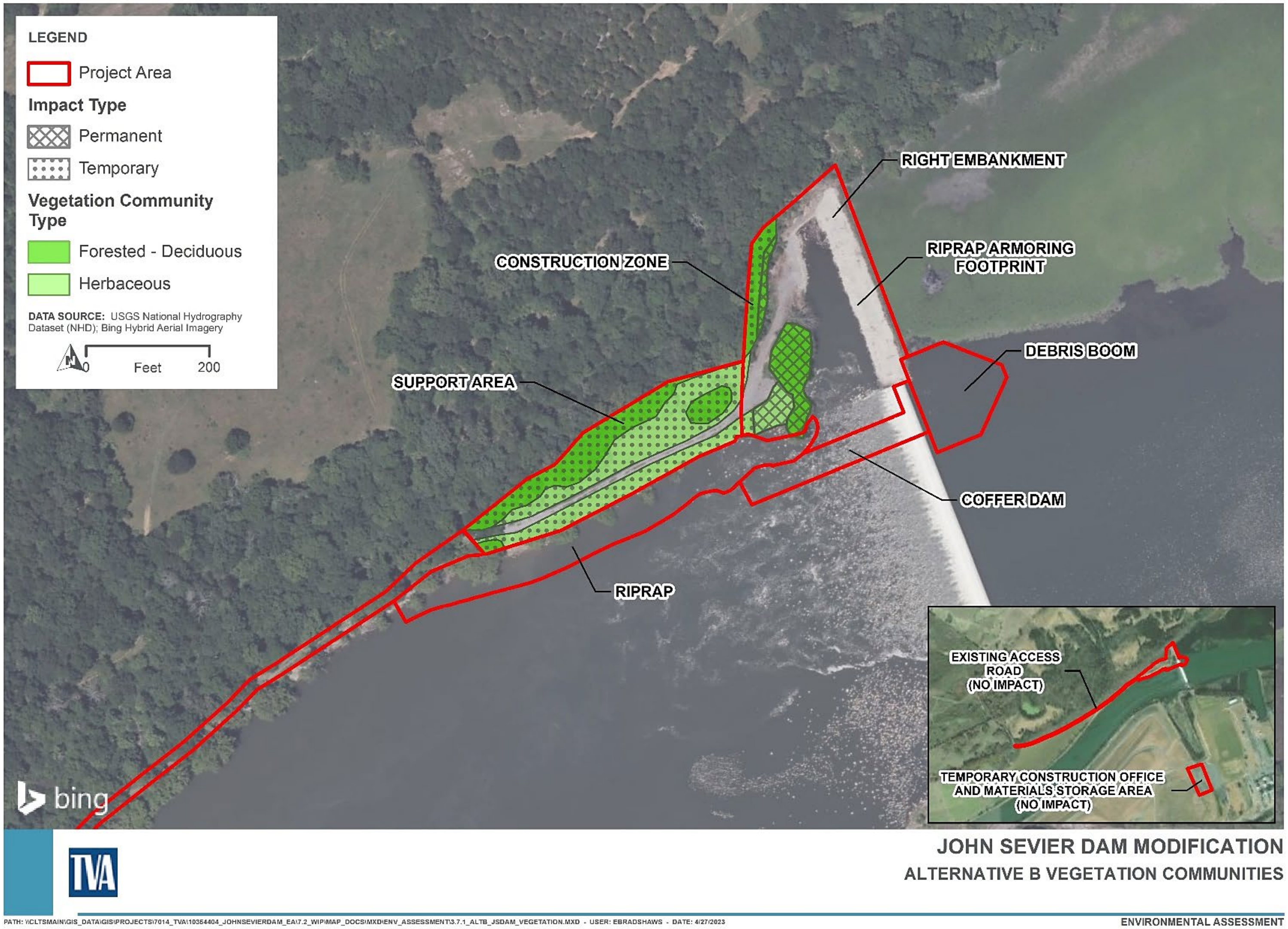


**Figure 3.7-1. Vegetation Communities within the JSF Dam Project Alternative B Footprint**

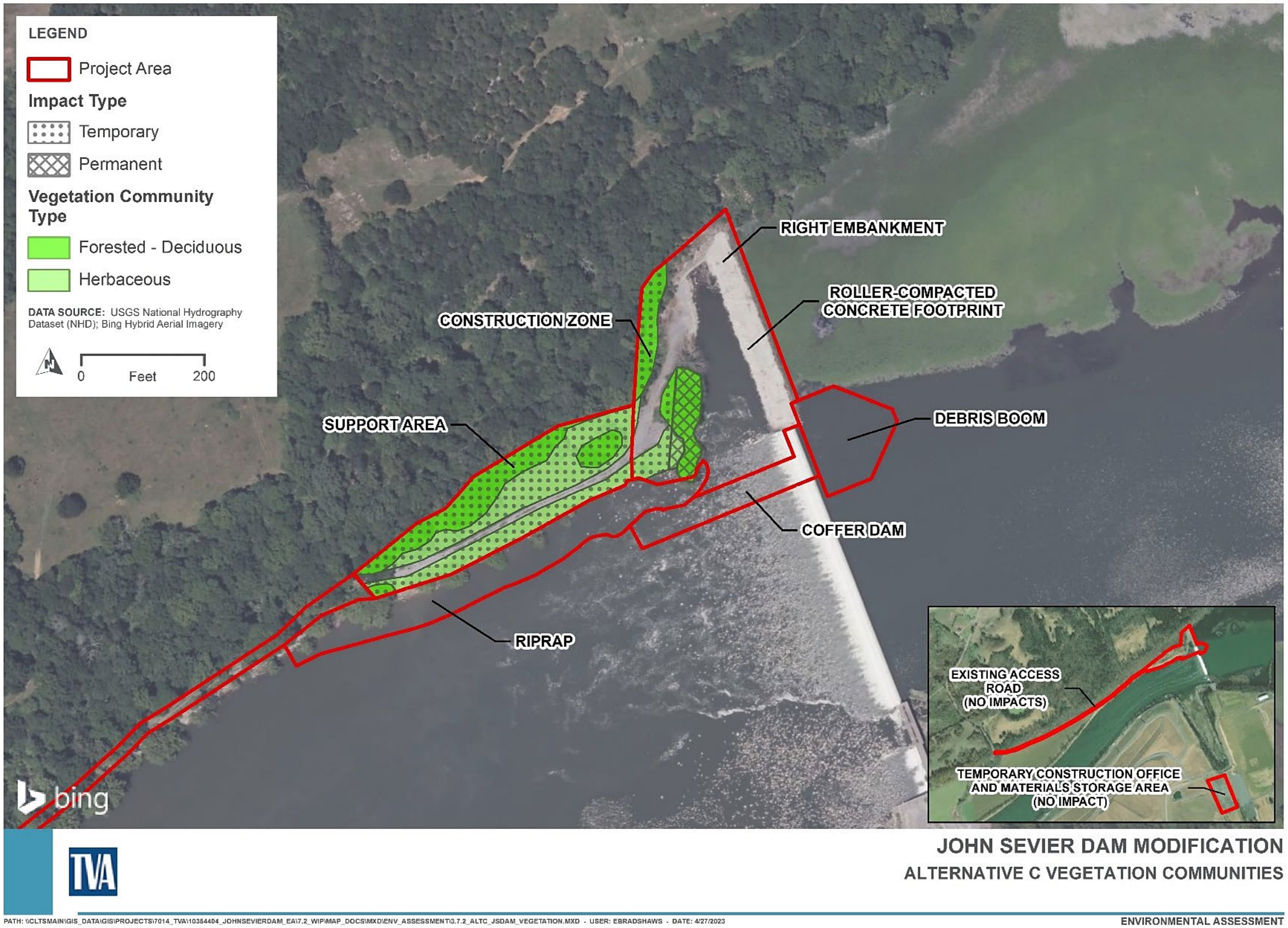


**Figure 3.7-2. Vegetation Communities within the JSF Dam Project Alternative C Footprint**

## 3.8 Wildlife

This section describes the wildlife observed in the Project Area or assumed to occur based on the types of habitats observed during field surveys. Threatened and endangered species are addressed in Section 3.10.

### 3.8.1 Affected Environment

The Project Area is largely an existing gravel road that travels along the edge of the Cherokee Reservoir lined with deciduous trees and other early successional vegetation communities leading to the north side of the JSF Dam. The Project Area is heavily disturbed as a result of its previous uses. The landscape in the surrounding area is predominantly rural and agricultural/pastoral lands with fragments of upland forest.

#### 3.8.1.1 General Wildlife

The narrow tree lines along the existing gravel road comprised of deciduous hardwood species, shrubs, and cedars adjacent the Cherokee Reservoir provide habitat for common birds such as Carolina chickadee, Carolina wren, cedar waxwings, chipping sparrow, eastern blue bird, eastern towhee, golden crowned kinglet, northern cardinal, northern flicker, northern mockingbird, prairie warbler, pine warbler, red tailed hawk, song sparrow, tufted titmouse, and white-throated sparrow (National Geographic 2002). Mammals found in these habitats include common raccoon, eastern gray squirrel, and Virginia opossum (Whitaker 1996). Common amphibian and reptile species also use similarly disturbed habitats including American toad, eastern box turtle, eastern garter snake, and Fowler's toad (Powell et al. 2016).

Two records of wading bird colonies are known within 3 miles of the Project Area. The nearest wading bird colony is approximately 0.9 miles from the Project Area. No wading bird colonies were observed during a field survey of the Project Area in August 2022 (TVA 2022c); however, a great blue heron was observed flying over the Cherokee Reservoir during the field survey.

Review of the USFWS Information for Planning and Consultation (IPaC) tool in July 2022, and confirmed in May 2023 (USFWS 2023), identified eight migratory birds of conservation concern that could occur within the Project Area: bald eagle, black-billed cuckoo, chimney swift, prairie warbler, prothonotary warbler, red-headed woodpecker, rusty blackbird, and wood thrush (TWRA 2022). See Threatened and Endangered Species section for discussion of bald eagles. Chimney swifts are summer residents in Tennessee and use chimneys in more urban areas as nesting sites and communal roosts (Palmer-Ball 1996). No chimney-like structures exist within the Project Area. Black-billed cuckoos are rare summer residents in Tennessee typically found nesting along forest edges and are frequently associated with water throughout its range (Nicholson 1997). Prairie warblers are summer residents in Tennessee and are typically use pine forests to forage and nest in. Prothonotary warblers are a summer resident in Tennessee and are typically found near water where nests are built in cavities over or near slow moving water (Petit 2020). Red-headed woodpeckers are year-round residents in Tennessee and typically are found in treed areas that has a high presence of snags that can be used for nesting (Frei et a. 2020). Rusty blackbirds are winter residents in Tennessee and utilize forested wetland habitats (Avery 2020). No forested wetlands exist within the Project Area.

Two caves are known within 3 miles of the Project Area. The nearest cave is approximately 1.7 miles from the Project Area. Caves were not observed during the field survey (TVA 2022c).

### 3.8.2 Environmental Consequences

#### 3.8.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment; however, maintenance alone would not address the risks identified in the 2019 JSF Dam risk assessment. Maintenance of the dam could include small amounts of tree removal that may result in minor impacts to wildlife depending on the timing and extent. Potential impacts of tree removal would be assessed on a project-specific basis to ensure compliance with state and federal law.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment could result in the potential migration of mercury laden sediment downstream of the dam, damage or falling of trees, and/or the washing away of vegetative habitats that would potentially have a large impact on wildlife or their habitats immediately downstream of the dam with the potential for contamination even further downstream. Depending on the severity of the release, or timing of tree removal for maintenance actions this alternative could result in large adverse environmental consequences to wildlife and their habitats and/or cumulative effects.

#### 3.8.2.2 Alternative B

Under Alternative B, TVA would construct additional riprap armoring on the right embankment to act as a rockfill spillway and would require actions including but not limited to removing trees and vegetation, grading, grubbing, drilling, and dam modifications.

Alternative B would result in displacement of any wildlife (primarily common, habituated species) currently using the area. Direct effects to some individuals could occur if those individuals are immobile during the time of habitat removal (e.g., during breeding/nesting seasons). Habitat removal likely would disperse mobile wildlife into surrounding areas in attempts to find new food resources, shelter, and to reestablish territories. Due to the amount of similarly suitable habitat in areas immediately adjacent to the Project Area, populations of common wildlife species likely would not be impacted by the proposed project actions.

The USFWS IPaC tool identified eight migratory birds of conservation concern that could occur within the Project Area: bald eagle, black-billed cuckoo, chimney swift, prairie warbler, prothonotary warbler, red-headed woodpecker, rusty blackbird, and wood thrush. Within the Project Area habitat is not present for chimney swifts, prairie warbler, prothonotary warblers, or rusty blackbirds. See Section 3.10.1.2 on Threatened and Endangered Species (Terrestrial Animals) for impacts regarding the bald eagle. Potential nesting and foraging habitat for black-billed cuckoo and wood thrush is present within the Project Area. Tree removal is proposed between November 15, 2023 and March 31, 2024, when neither black-billed cuckoo or wood thrush would be expected to be on the landscape. Non-nesting individuals of red-headed woodpecker present on the landscape would be expected to be able to flush to nearby suitable habitat due to disturbance from project actions. Due to the relatively small number of trees proposed for removal, availability of suitable habitat adjacent to the Project Area, and winter timing of tree removal, proposed actions under Alternative B are not expected to impact populations of black-billed cuckoos, red-headed woodpecker, or wood thrushes.

Due to the distance of known records of wading bird colonies (approximately 0.9 miles), no wading bird colonies would be impacted as a result of Alternative B. Foraging habitat is present along the edges of the Cherokee Reservoir and along the edge of the Project Area. Individuals present foraging close to the proposed action would be expected to be able to flush to nearby suitable habitat if disturbed by project actions. Wading bird colonies would not be impacted by actions under Alternative B. Impacts to terrestrial wildlife are expected to be minor since tree removal has been limited to a small number of trees that will be removed during winter months, and since wildlife are expected to disperse into surrounding areas during construction. No long-term or additional impacts are expected to wildlife and therefore no cumulative effects are anticipated.

#### 3.8.2.3 Alternative C

Under Alternative C, TVA would construct a RCC dam downstream of the existing embankment and would backfill between the two structures. Alternative C would require actions including, but not limited to, removing trees and vegetation, water diversion and control, stabilization, drilling, excavation, and construction of the RCC.

Impacts to terrestrial wildlife under Alternative C would be the same as Alternative B since tree removal has been limited to a small number of trees that will be removed during winter months, and since wildlife are expected to disperse into surrounding areas during construction. No long-term or additional impacts are expected to wildlife and therefore no cumulative effects are anticipated.

## 3.9 Aquatic Ecology

Aside from the ESA and related state laws, as well as harvest regulations established by states, the CWA is the primary law protecting aquatic life. The CWA is the primary federal statute that governs the discharge of pollutants and fill materials into WOTUS. under Sections 401, 402, and 404. Water quality standards and NPDES discharge limits are established, in part, to protect aquatic life. Aquatic threatened and endangered species are addressed in Section 3.10.

### 3.9.1 Affected Environment

The proposed JSF Dam improvement Project Area is located in Hawkins County, Tennessee, and falls within the Holston River (0601010401) and Cherokee Lake (0601010402) HUC-10 watersheds, in the Southern Shale Valleys level IV sub-ecoregion of the greater Ridge and Valley III ecoregion (Griffith et al. 1998). During an August field survey of the Project Area, hydrologic determinations were made using the Tennessee Division of Water Pollution Control (Version 1.5) field forms by a TVA employee qualified hydrologic professional. These forms evaluate the geomorphology, hydrology, and biology of each stream.

The pre-impounded Holston River historically contained over 100 species of fish and 45 species of mussels, but habitat fragmentation from the construction of dams and increased sediment and other pollutants from development and agriculture have greatly reduced the aquatic biodiversity of this river (Neves and Angermeier 1990). Therefore, the tailwater section below JSF Dam is ecologically limited, and species assemblages are poor, with no recent records of sensitive species. Though the purple bean, pink mucket, and sheepnose are considered extant in the Holston River, these mussel species would not be impacted as a result of the proposed alternatives. The federally listed purple bean mussel historically occurs in Beech Creek, a tributary to the Holston River that flows into the John Sevier Detention Reservoir at approximately HRM 108.7 which is more than one river mile upstream of the JSF Dam (TVA 2015). Designated Critical Habitat (DCH) for the federally endangered purple bean mussel is located greater than two miles upstream of the Project Area. As such, no impacts to DCH for the purple bean would occur from the project. TVA would adhere to state and federal permit requirements and would commit to any mitigation provisions as a result of adverse modifications made to the Project Area.

### 3.9.2 Environmental Consequences

#### 3.9.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities could result in impacts to aquatic habitat if in-water work is required. As the JSF dam would be maintained in its current configuration, impacts associated with maintenance activities would likely be minor and temporary.

Maintenance alone would not address the risks identified in the 2019 JSF Dam risk assessment. Without modifications the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows. The dam would also be at an increased risk of moderate effects from internal erosion or internal erosion-related failure of the right embankment.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment, could result in the potential migration of mercury laden sediment downstream of the dam and could threaten water quality and benthic invertebrate communities in the tailwater. Decreased water quality could result in large and potentially cumulative impacts to downstream wetlands, aquatic habitats, and overall aquatic ecology.

#### 3.9.2.2 Alternative B

Impacts to surface waters under Alternative B are described in Section 3.4.2.2. Aquatic animals and habitats would experience temporary minor impacts due to the placement of temporary fill during construction. Moderate permanent impacts include the loss of 0.57 acre of aquatic habitat within the footprint of the dam, and up to 0.86 acre of aquatic habitat along the shoreline for the placement of riprap for stabilization, however stabilization of the shoreline may benefit localized habitat and downstream by reducing sedimentation. Riprap also provides some habitat structure for small fish.

Aquatic habitat of the free-flowing Holston River below JSF Dam is considered poor due to impoundment effects downstream from Cherokee Dam and proximity to high flows from JSF Dam. With appropriate implementation of BMPs during site preparation activities, no additional impacts to aquatic species are anticipated to occur from Alternative B, and no cumulative effects are anticipated as no additional in-water or permanent habitat loss is expected.

#### 3.9.2.3 Alternative C

Impacts to surface waters under Alternative C are described in Section 3.4.2.3. Aquatic animals and habitats would experience temporary minor impacts due to the construction of a temporary coffer dam to support dewatering of the construction area and placement of temporary fill during construction. Moderate permanent impacts include the loss of 0.49 acre of aquatic habitat within the footprint of the dam, and up to 0.88 acre of aquatic habitat along the shoreline for the placement of riprap for stabilization, however stabilization of the shoreline may provide localized benefits to habitats downstream by reducing sedimentation. Riprap also provides some habitat structure for small fish. The RCC gravity dam placement is proposed for construction on dry or dewatered land so impacts to aquatic habitat would be minor and only temporary impacts from sedimentation are expected from associated construction activities.

Aquatic habitat of the free-flowing Holston River below JSF Dam is considered poor due to impoundment effects downstream from Cherokee Dam and proximity to high flows from JSF Dam. Alternative C would require less of an embankment removal than Alternative B, and would therefore, reduce the potential for sediment discharges to the Cherokee Reservoir. Appropriate BMPs would be implemented during construction activities to minimize additional impacts or risk to aquatic resources and biota in the vicinity of the Project Area. Aquatic habitat of the free-flowing Holston River below JSF Dam is considered poor. With appropriate implementation of BMPs during site preparation activities, no additional impacts to aquatic species are anticipated to occur from Alternative C, and cumulative effects are not anticipated as additional in-water or permanent habitat loss is not expected.

## 3.10 Threatened and Endangered Species

Several species of plants and animals are protected under the ESA and related state laws. The ESA was implemented to provide a framework to conserve and protect threatened and endangered species and their habitats. This act authorized the determination and listing of species as endangered and threatened; prohibited unauthorized taking, possession, sale, and transport of endangered species; provided authority to acquire land for the conservation of listed species; and authorized civil and criminal penalties for violating the ESA (among other authorizations). An endangered species is defined by the ESA as any species in danger of extinction throughout all or a large portion of its range. Likewise, a threatened species is likely to become endangered within the foreseeable future throughout all or a large part of its range. Critical habitats, essential to the conservation of listed species, also can be designated under the ESA. The ESA establishes programs to conserve and recover endangered and threatened species and makes their conservation a priority for federal agencies. Under Section 7 of the ESA, federal agencies are required to consider the potential effects of their proposed actions on federally listed endangered and threatened species and critical habitats. If the proposed action has the potential to affect these resources, the federal agency is required to consult with the USFWS.

There are several laws, in addition to the ESA, and Executive Orders established for the protection of plant species and communities. The State of Tennessee provides protection for species considered threatened, endangered, or deemed in need of management within the state in addition to those federally listed under the ESA. The listing is handled by the TDEC; however, the Tennessee Natural Heritage Program and TVA both maintain databases of aquatic animal species that are considered threatened, endangered, special concern, or tracked in Tennessee.

Fish and game species are also protected by the hunting, fish, and trapping regulations enforced by the TWRA and USFWS. In addition to these laws, the Migratory Bird Treaty Act (MBTA) of 1918, the Bald and Golden Eagle Protection Act of 1940, and EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds also provide protection to birds. The MBTA and EO 13186 address most native birds occurring in the U.S. The MBTA makes the purposeful taking, killing, or possession of migratory birds, their eggs, or nests unlawful, except as authorized under a valid permit. EO 13186 focuses on federal agencies taking actions with the potential to have negative effects on populations of migratory birds. It provides broad guidelines on avian conservation responsibilities and requires agencies whose actions affect or could affect migratory bird populations to evaluate those impacts and implement practices to minimize, to the extent practicable, adverse effects on migratory bird resources. Section 3.10.1 below describes the threatened and endangered species of vegetation, terrestrial, and aquatic species evaluated in this EA.

## 3.10.1 Affected Environment

### 3.10.1.1 Vegetation

Review of the TVA Regional Natural Heritage Database (RNHD) (TVA 2022d) and USFWS IPaC (USFWS 2023b) reports list one state-protected species of special concern, American barberry, and no known federally listed plant species within 5 miles of the Project Area. No federally listed plants have been previously reported from Hawkins County, Tennessee where the JSF Dam is located. A desktop review of the Project Area indicates that no habitat for federal or state-listed plant species occurs in the areas where work would occur. No DCH for plants is established in the Project Area.

### 3.10.1.2 Terrestrial Species

Review of the TVA RNHD and USFWS IPaC reports three species of state conservation concern (osprey, southern bog lemming, and Virginia rail), one federally protected species (bald eagle), and one federally listed species (northern long-eared bat) within 3 miles of the Project Area (TVA 2022d; USFWS 2023b). Two additional federally listed species (gray bat and Indiana bat) and one species proposed for federal listing (tricolored bat) are known from Hawkins County, Tennessee. The USFWS also reported one candidate species for federal listing that could occur within the Project Area (monarch butterfly). A full species list and conservation statuses is presented in Table 3.10-1. Species-specific information and habitat suitability within the Project Area are discussed below.

Bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). This species is associated with large mature trees capable of supporting their nests that can weigh several hundred pounds and are typically built near larger waterways where they forage primarily for fish (USFWS 2007a). Bald eagles are most reproductively successful in areas where human disturbance is minimized (Wilson et al. 2018). Adults exhibit high pair and nest site fidelity throughout their lifetime (Jenkins and Jackman 1993). Three bald eagle nest records are known within 3 miles of the Project Area, the nearest occurring approximately 0.9 miles away. The Project Area consists of a gravel road lined with deciduous trees of varying ages. Foraging habitat is present over the Cherokee Reservoir. No bald eagles or nests were observed during field reviews of the Project Area in August 2022.

Ospreys are medium-sized raptors that are typically associated with water since thus species forages exclusively for fish (Bierregaard et al. 2020). In Tennessee, ospreys arrive on the landscape in March to begin their breeding season, building nests and hatching young from April through July. Ospreys build nests in trees or man-made structures (e.g., transmission structures) near or over water. In October, ospreys migrate south for the winter non-breeding period (Poole 1989). Seven osprey nests are within 3 miles of the Project Area. The nearest osprey nest is approximately 0.4 miles from the Project Area on a transmission structure on the John Sevier Combined Cycle Plant property. Foraging habitat is present over the Cherokee Reservoir. No ospreys or osprey nests were observed during field reviews of the Project Area in August 2022.

**Table 3.10-1. Federally listed terrestrial animal species reported from Hawkins County, Tennessee and other species of conservation concern documented within 3 miles of John Sevier Fossil Plant Dam Modifications Project – ESCS ID #41210 1**

| Common Name | Scientific Name | Federal Status[2] | State Status[2] (Rank[3]) |
|---|---|---|---|
| **Birds** | | | |
| Bald eagle | *Haliaeetus leucocephalus* | DL | D (S3) |
| Osprey | *Pandion haliaetus* | - | (S3) |
| Virginia rail | *Rallus limicola* | - | (S1B, S3N) |
| **Invertebrates** | | | |
| Monarch butterfly[4] | *Danaus plexippus* | C | S4 |
| **Mammals** | | | |
| Gray bat[5] | *Myotis grisescens* | E | E(S2) |
| Indiana bat[5] | *Myotis sodalis* | E | E(S1) |
| Northern long-eared bat | *Myotis septentrionalis* | T | T(S1S2) |
| Southern bog lemming | *Synaptomys cooperi* | - | D(S4) |
| Tricolored bat[5] | *Perimyotis subflavus* | PE | T(S2S3) |

[1]Source: TVA Regional Natural Heritage Database, extracted 7/29/2022 (TVA 2022d) and USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/), accessed 7/29/2022 (USFWS 2023b).
[2]Status Codes: C = Candidate species; D = Deemed in Need of Management; DL = Delisted; E = Endangered; PE = Proposed Endangered; T = Threatened.
[3]State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; B = Breeding Population; N = Non-breeding Population.
[4]Historically this species has not been tracked by state or federal heritage programs; USFWS has determined this species could occur within the Project Area.
[5]Species known from Hawkins County, Tennessee but not from within three miles of the project footprint.

Virginia rails are secretive freshwater marsh birds that rarely breed in Tennessee but are regularly observed during migration (Nicholson 1997). Virginia rail breeding season typically begins in March, when the birds build nests in marsh vegetation. Rail diet consists largely of small vertebrate and invertebrates. The nearest record of a Virginia rail is approximately 0.4 miles from the Project Area, where a dead specimen was observed in a field. Reports from eBird (a citizen science observation aggregation project) shows consistent records of migratory individuals observed along the Holston River (>1 mile from Project Area) over the last 5 years (eBird 2022). No marsh habitat was observed within the Project Area during field surveys in August 2022.

The monarch butterfly is a highly migratory species, with eastern U.S. populations overwintering in Mexico. Monarch populations typically return to the eastern U.S. in April (Davis and Howard 2005). Summer breeding habitat requires milkweed plant species, on which adults exclusively lay eggs for larvae to develop and feed on. Adults drink nectar from other blooming wildflowers when milkweeds are not in bloom (NatureServe 2022). No milkweed plants were observed during a field review in August 2022. No monarch butterflies were observed during field review of the Project Area in August 2022. Some wildflower plants were observed within the Project Area that monarchs could use as foraging habitat. Though this species has not been historically tracked by state or federal heritage programs, the USFWS IPaC tool determined that this species could occur within the Project Area (USFWS 2023b).

Southern bog lemmings are small mammals typically associated with bogs, meadows, and marshes. Southern bog lemmings create burrows 6-12 inches below the surface and feeds on herbaceous plants and small fruits (NatureServe 2022). A historical record of a southern bog lemming exists from 1937 approximately 2.2 miles from the project footprint (TVA 2022d). Habitat for the southern lemming is not present within the Project Area.

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (USFWS 1982; Tuttle 1976a). Bats disperse over bodies of water at dusk where they forage for insects emerging from the surface of the water (Tuttle 1976b). Gray bat records are known from Hawkins County, Tennessee, but not within 3 miles of the Project Area (TVA 2022d). The nearest record is from a cave approximately 6.6 miles from the Project Area. Two caves are known within 3 miles of the Project Area (TVA 2022d). The nearest cave is approximately 1.7 miles from the Project Area. No caves were observed during field review of the Project Area in August 2022 (TVA 2022c). Foraging habitat for the gray bat is present along the Holston River and Cherokee Reservoir.

Indiana bats hibernate in caves during winter. They use the areas around the caves for swarming (mating) in the fall and staging in the spring, prior to migration to summer habitat. During summer, Indiana bats roost under the exfoliating bark of dead snags and living trees in mature forests with an open understory and a nearby source of water (USFWS 2007b; Kurta et al. 2002). Indiana bats are known to change roost trees frequently throughout the season, while still maintaining site fidelity, returning to the same summer roosting areas in subsequent years (USFWS 2007b). There are no records of Indiana bats within 3 miles of the Project Area, but one record is known within Hawkins County, approximately 12 miles from the Project Area (TVA 2022d).

The northern long-eared bat predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures (NatureServe 2022). During the fall and spring, they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees (typically greater than 3 inches in diameter). Roost selection by northern long-eared bat is similar to that of Indiana bat, however, northern long-eared bats are thought to be more opportunistic in roost site selection. This species also roosts in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (USFWS 2014). A summer mist-net record of a northern long-eared bat exists approximately 2.5 miles from the Project Area. However, the USFWS does not consider the project area an area where northern long-eared bat is likely to occur at present (Giddens 2023)..

Tricolored bats hibernate in caves or man-made structures such as culverts or bridges (Fujita and Kunz 1984; Newman et al. 2021). During the summer, tricolored bats roosting in clumps of tree foliage, often in oak and hickory trees (Veilleux et al. 2003; O'Keefe et al; 2009; Schaefer 2017; Thames 2020). Foraging studies of tricolored bats are lacking, but it is believed they typically forage near their roost trees in forested areas and riparian corridors. The nearest record of a tricolored bat is from a cave approximately 6.6 miles from the Project Area.

Two caves are known within 3 miles of the Project Area. The nearest cave is approximately 1.7 miles from the Project Area. No caves were observed in the Project Area during field review in August 2022. Based on the 2022 Range-Wide Indiana Bat and Northern Long-eared Bat Survey Guidelines (USFWS 2022) and a field survey of the Project Area, TVA has determined that a majority of the trees proposed for removal do provide suitable habitat for summer roosting Indiana bat and northern long-eared bat. These trees may also provide roosting habitat for the tricolored bat. The trees proposed for removal consist of snags and live trees with crevices and hollows, suitable for summer roosting. The forest edges along the river offer suitable forest edge foraging habitat. Foraging habitat for these species is also present in open spaces within the Project Area and over the Holston River and Cherokee Reservoir.

#### 3.10.1.3 Aquatic Species

A query of the TVA RNHD and the USFWS IPaC indicated 13 federally listed species (eight mussels, two fish, and one under-review snail) occurring within the potentially affected 10-digit HUC watershed adjacent to the proposed Project Area (Table 3.10-2). Extant populations of spotfin chub have been recorded upstream of the Project Area; however, downstream dispersion is restricted by the presence of JSF Dam and its effects on aquatic habitat. Extant populations of the purple bean mussel have been recorded upstream of the Project Area within Beech Creek, a tributary to the Holston River located more than one river mile upstream of the JSF Dam (TVA 2015).

The pre-impounded Holston River historically contained over 100 species of fish and 45 species of mussels, but habitat fragmentation from the construction of dams and increased sediment and other pollutants from development and agriculture have greatly reduced the aquatic biodiversity of this river (Neves and Angermeier 1990). Therefore, the tailwater section below JSF Dam is ecologically limited, and species assemblages are poor, with no recent records of sensitive species. Though the purple bean, pink mucket, and sheepnose are considered extant in the Holston River, these mussel species would not be impacted as a result of the proposed alternatives. The federally listed purple bean mussel historically occurs in Beech Creek, a tributary to the Holston River that flows into the John Sevier Detention Reservoir at approximately HRM 108.7 which is more than one river mile upstream of the JSF Dam (TVA 2015). DCH for the federally endangered purple bean mussel is located more than two miles upstream of the Project Area. As such, no impacts to DCH for the purple bean would occur from the Project.

**Table 3.10-2. Records of federal and state-listed aquatic animal species within the Holston River (0601010401) and Cherokee Lake (0601010402) 10-digit HUC watershed (TVA EA 2022-15).[1]**

| Scientific Name | Common Name | [2]State Rank | [3]State Status | [4]Element Rank | [5]Federal Status |
|---|---|---|---|---|---|
| **Fishes** | | | | | |
| *Percina burtoni* | Blotchside Logperch | S2 | D | E | |
| *Carpiodes velifer* | Highfin Carpsucker | S2S3 | D | X? | |
| *Erimystax cahni* | Slender Chub | S1 | T | X | T, XN |
| *Erimonax monachus* | Spotfin Chub | S2 | T | E | T, XN |
| *Percina aurantiaca* | Tangerine Darter | S3 | D | E | |
| *Chrosomus tennesseensis* | Tennessee Dace | S3 | D | E | |
| **Mussels** | | | | | |
| *Lemiox rimosus* | Birdwing Pearlymussel | S1 | E | H | E, XN |
| *Quadrula intermedia* | Cumberland Monkeyface | S1 | E | X | E, XN |
| *Dromus dromas* | Dromedary Pearlymussel | S1 | E | X | E, XN |
| *Fusconaia cuneolus* | Fine-rayed Pigtoe | S1 | E | X | E, XN |

| Scientific Name | Common Name | [2]State Rank | [3]State Status | [4]Element Rank | [5]Federal Status |
|---|---|---|---|---|---|
| *Epioblasma torulosa gubernaculum* | Green Blossom Pearlymussel | SX | E | X | E, PDL |
| *Vilosa perpurpurea* | Purple Bean | - | - | - | E |
| *Vilosa trabalis* | Cumberland Bean | - | - | - | E |
| *Epioblasma florentina walkeri* | Tan Riffleshell | S1 | E | X | E |
| *Venustaconcha trabalis* | Tennessee Bean | S1 | | E | E, XN |
| *Epioblasma turgidula* | Turgid Blossom Pearlymussel | SX | E | X | E, PDL |
| **Snails** | | | | | |
| *Io fluvialis* | Spiny Riversnail | S2 | | X | UR |

[1] Source: TVA Natural Heritage and USFWS IPaC databases queried by TVA in September 2022 and confirmed in May 2023 (TVA 2022d; USFWS 2023b).
[2]State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; SX = Presumed Extirpated
[3] State Status Codes: D = Deemed in need of conservation; E = Endangered; T = Threatened
[4] Element Rank (=population) Rank; E = Extant record ≤25 years old; H = Historical record >25 years old; ? = Uncertain status; X – Extirpated; AC - Excellent, good, or fair estimated viability
[5] Federal Status Code: LT = Listed Threatened; LE = Listed Endangered; PDL = Petitioned for Delisting; XN = Experimental Population, Non-Essential

## 3.10.2 Environmental Consequences

### 3.10.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment; however, maintenance alone would not address the risks identified in the 2019 JSF Dam risk assessment. Without modifications the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows.

#### 3.10.2.1.1 Vegetation

Due to its prior land use, the proposed project is incapable of supporting state-listed and federally listed plant species due to lack of habitat for those species. Since both federally and state-listed plant species are not in the vicinity that would be affected during maintenance activities or if there was a failure of the dam, the no action would not affect rare plant species. However, in the event of dam failure, there could be large adverse environmental consequences to unknown rare plant species downstream. Depending on the magnitude of dam failure and extent of potential downstream impacts, cumulative effects could occur.

#### 3.10.2.1.2 Terrestrial Species

Maintenance of the dam could include small amounts of tree removal that may result in minor impacts to Indiana bat, northern long-eared bat, and/or tricolored bat depending on the timing, extent, and roosting suitability of trees. Potential impacts of tree removal would be assessed on a project-specific basis to ensure compliance with ESA and removal of suitable habitat would be addressed and documented under TVA’s Bat Programmatic Consultation, originally signed in 2018 and updated in 2023 (USFWS 2018, 2023a) or with separate Section 7 consultation, as appropriate. Under this consultation TVA has determined that proposed actions may affect and are likely to adversely affect Indiana bat due to summer roosting habitat removal, may affect but are not likely to adversely affect northern long-eared bat due to lack of post-white-nose syndrome summer records or northern long-eared bat hibernacula in the vicinity, and may affect but are not likely to adversely affect gray bats due to lack of impacts to hibernacula. Outside of this programmatic consultation, TVA has determined that the proposed maintenance actions would not jeopardize the continued existence of the tricolored bat.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment could result in the potential migration of mercury laden sediment downstream of the dam, damage or falling of trees, and/or washing away of vegetative habitats that could potentially affect terrestrial animals or their habitats immediately downstream of the dam with the potential for contamination even further downstream. Depending on the severity of the release or timing of tree removal for maintenance actions, this alternative could result in moderate to large adverse environmental consequences to terrestrial animals and their habitats. Depending on the magnitude of dam failure and extent of potential downstream impacts, cumulative effects could occur.

#### 3.10.2.1.3 Aquatic Species

No extant listed aquatic species or DCH is known from the potentially affected 10-digit HUC watershed adjacent to the proposed Project Area. Therefore, with appropriate implementation of BMPs during periodic repair and maintenance activities, no impacts to federal or state listed aquatic species are anticipated to occur as a result of Alternative A. Internal erosion alone or that leads to a dam failure could have large adverse impacts on general aquatic ecology due to potential migration of mercury laden sediments downstream of the dam. Depending on the magnitude of dam failure and extent of potential downstream impacts, cumulative effects could occur.

### 3.10.2.2 Alternative B

#### 3.10.2.2.1 Vegetation

Based on the current and historical industrial use of the Project Area and the ongoing vegetation management practices, suitable habitats for state or federally listed plant species are not present; therefore, there would be no affect to these protected species with the adoption of Alternative B. Cumulative effects are not expected.

#### 3.10.2.2.2 Terrestrial Species

Under Alternative B, TVA would construct additional riprap armoring on the right embankment to act as a rockfill spillway and would require actions including but not limited to removing trees and vegetation, grading, grubbing, drilling, and dam modifications.

Due to the distance from known records to the Project Area (approximately 1.0 mile), no bald eagle nests would be impacted by the proposed project actions. Foraging habitat is present adjacent to the Project Area, and BMPs would be implemented to minimize impacts to aquatic foraging habitat. Project actions are in compliance with the National Bald Eagle Management Guidelines. With the use of BMPs, potential effects to bald eagles would be minor under Alternative B.

Similarly, due to the distance from known records to the Project Area (approximately 0.4 miles), no osprey nests would be impacted by the proposed project actions. Foraging habitat is present within and adjacent to the Project Area, and BMPs would be implemented to minimize impacts to aquatic foraging habitat. With the use of BMPs, potential effects to ospreys would be minor under Alternative B.

Breeding and foraging habitat for the Virginia rail is not present withing the Project Area. Considering this and the distance to known records (approximately 0.4 miles), impacts to the Virginia rail are not anticipated as a result of Alternative B.

Monarch butterfly foraging habitat exists throughout the Project Area. Breeding habitat was not observed during field surveys. Vegetation removal and clearing in the construction support area may impact some areas of foraging habitat. Several areas adjacent to the Project Area offer suitable habitat that adult individuals could utilize if they are disturbed from the area during the time of construction. This species is currently listed under the ESA as a candidate species and is not subject to Section 7 consultation under the ESA. Effects to monarch butterfly are expected to be minor and would not jeopardize the continued existence of the species as a result of Alternative B.

Due to the lack of habitat present within the Project Area, the distance to known records, and historical nature of existing records (1937), the south bog lemming would not be impacted as a result of proposed actions under Alternative B.

Three federally listed or protected bat species and one bat species proposed for federal listing were addressed based on the potential for the species to occur in the Project Area. Each of these species (gray bat, Indiana bat, northern long-eared bat and tricolored bat) have the potential to occur within and utilize the Project Area. No caves or other hibernacula for gray bat, Indiana bat, northern long-eared bat or tricolored bat exist in the Project Area or would be impacted by the proposed actions. Approximately 6.38 acres of suitable bat habitat (3.0 acres suitable for roosting and 3.38 acres suitable for foraging) occurs in the Project Area within the proposed construction support area, along the existing access road, and in the proposed construction area (see Figure 3.10-1).

Under Alternative B, permanent tree removal would impact 0.57 acres of habitat suitable for roosting for Indiana bats, northern long-eared bats, and tricolored bats. The remainder of the project activities and vegetative clearing would result in temporary effects to suitable foraging habitat for the referenced bat species.

As part of the actions under Alternative B, permanent adverse effects would result from permanent removal of 0.57 acres of suitable summer roosting habitat for Indiana bats, northern long-eared bats, and tricolored bats. Temporary effects would occur to 3.38 acres of suitable foraging habitat located within the Alternative B footprint. Tree removal is proposed to occur between November 15, 2023 and March 31, 2024. During this time, tricolored bats, northern long-eared bats, and Indiana bats are not expected to be on the landscape. Removal of suitable habitat during the specific period would avoid direct impacts to these species as bats are roosting underground at that time. Tree lines also offer foraging habitat for Indiana bat, northern long-eared bat, and tricolored bat. Additional foraging habitat for these species as well as gray bats is present over the Cherokee Reservoir. BMPs would be implemented to minimize impacts to aquatic foraging habitat.

Activities associated with the proposed project with potential to effect listed bats, including tree removal and burning, were addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and completed in April 2018, and updated in 2023 (USFWS 2018, 2023a). For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on pages 5 and 6 of the TVA Bat Strategy Project Screening Form and need to be reviewed/implemented as part of the proposed project. Under this consultation and considering the scope of the proposed project actions, winter tree removal, distance to known bat records, and implementation of BMPs and conservation measures, TVA has determined that proposed actions may affect and are likely to adversely affect Indiana bat due to summer roosting habitat removal, may affect but are not likely to adversely affect northern long-eared bat due to lack of post-white-nose syndrome summer records or northern long-eared bat hibernacula in the vicinity, and may affect but are not likely to adversely affect gray bats due to lack of impacts to hibernacula. Outside of this programmatic consultation, TVA has determined that the proposed actions under alternative B would not jeopardize the continued existence of the tricolored bat.

Due to the limited spatial and temporal scope of this project, cumulative effects to protected terrestrial species are not expected.

#### 3.10.2.2.3 Aquatic Species

No extant listed aquatic species or DCH is known from the potentially affected 10-digit HUC watershed adjacent to the proposed Project Area. DCH for the purple bean exists less than 3 miles upstream of the proposed Project Area, but there would be no adverse impacts to DCH for this species or its primary constituent elements. Therefore, with appropriate implementation of BMPs during site preparation activities, no impacts to federal or state listed aquatic species are anticipated to occur as a result of the proposed TVA action. Cumulative effects are not expected.

### 3.10.2.3 Alternative C

#### 3.10.2.3.1 Vegetation

The proposed project is incapable of supporting state-listed and federally listed plant species due to lack of habitat for those species; therefore, there would be no affect to these species with the adoption of Alternative C. Cumulative effects are not expected.

#### 3.10.2.3.2 Terrestrial Species

Under Alternative C, TVA would construct a RCC dam downstream of the existing embankment and backfill between the two structures. Alternative C would require actions including, but not limited to, removing trees and vegetation, water diversion and control, stabilization, drilling, excavation, and construction of the RCC. Bat habitat identified within the Alternative C footprint is shown in Figure 3.10-2. Under Alternative C, permanent impacts would result from removal of 0.57 acres of suitable bat roosting habitat, and temporary clearing and construction activity would impact approximately 3.38 acres of suitable bat foraging habitat. Impacts to threatened and endangered terrestrial animal species under Alternative C would be the same as Alternative B which would result in permanent removal of 0.57 acres of suitable bat roosting habitat and temporary clearing and disturbance to 3.38 acres of suitable bat foraging habitat. Cumulative effects are not expected.

#### 3.10.2.3.3 Aquatic Species

No extant listed aquatic species or DCH is known from the potentially affected 10-digit HUC watershed adjacent to the proposed Project Area. DCH for the purple bean exists less than 3 miles upstream of the proposed Project Area, but there would be no adverse impacts to

DCH for this species or its primary constituent elements. Therefore, with appropriate implementation of BMPs during site preparation activities, no impacts to federal or state listed aquatic species are anticipated to occur as a result of the proposed TVA action. Cumulative effects are not expected.

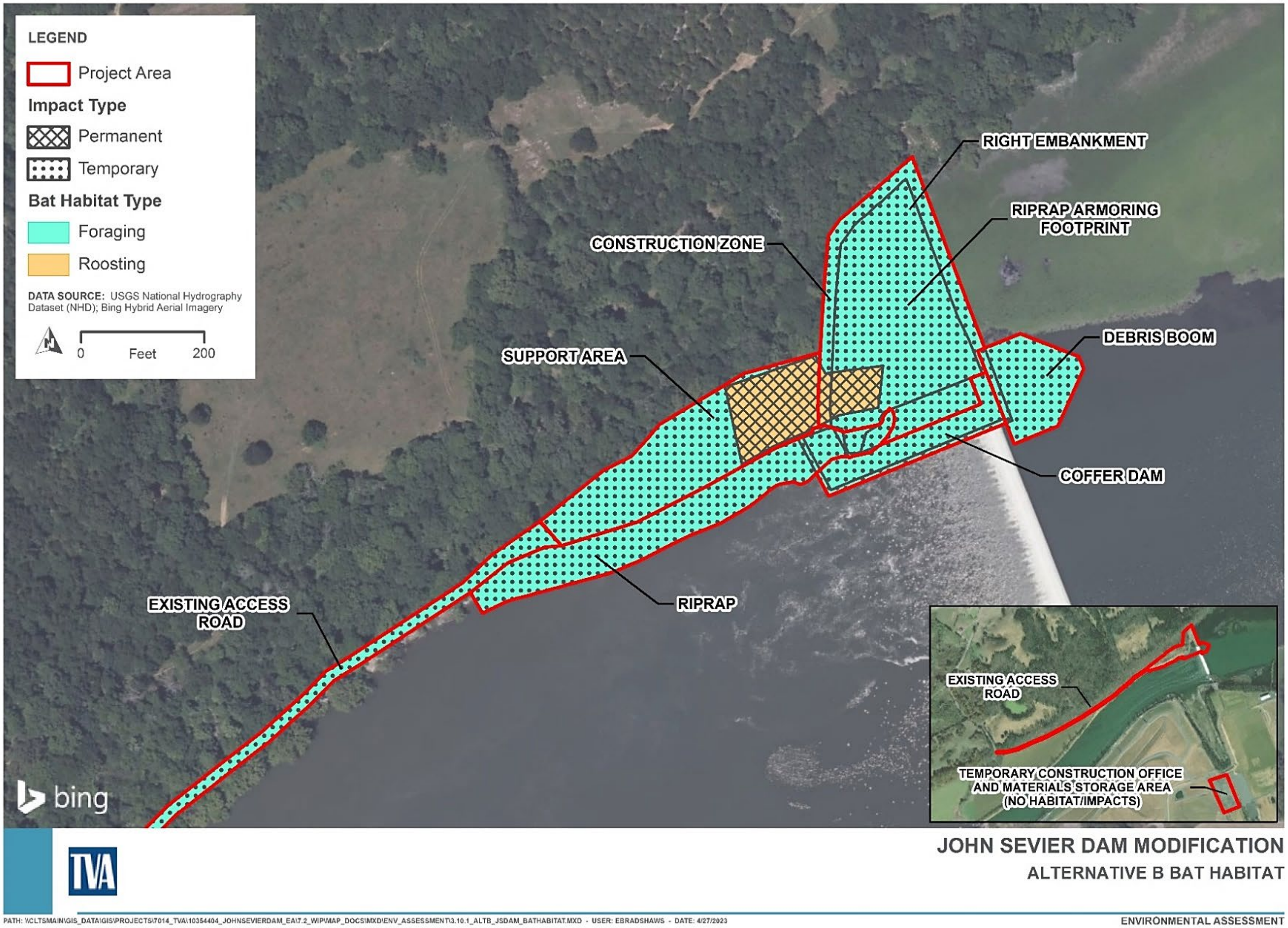


**Figure 3.10-1. Bat habitat identified within the JSF Dam Modification Project Area for Alternative B**

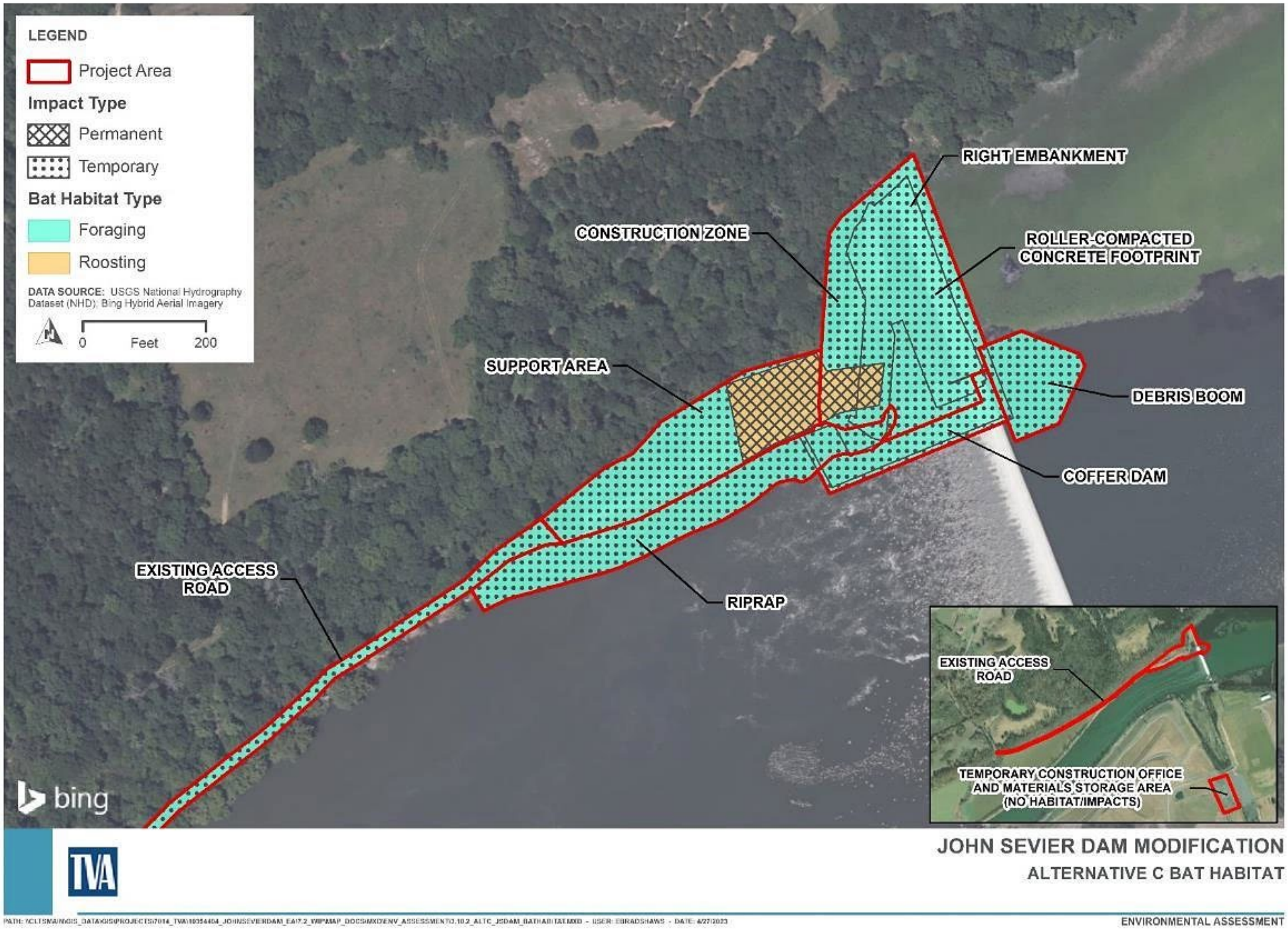


**Figure 3.10-2. Bat habitat identified within the JSF Dam Modification Project Area for Alternative C**

## 3.11 Natural Areas, Parks, and Recreation

Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, U.S. Forest Service, State of Tennessee) to protect and maintain certain ecological and/or recreational features. Natural areas include ecologically significant sites; federal, state, or local park lands; national or state forests; wilderness areas; scenic areas; wildlife management areas; recreational areas; greenways; trails; Nationwide Rivers Inventory streams; and wild and scenic rivers.

Ecologically significant sites are either tracts of privately owned land that are recognized by resource biologists as having significant environmental resources or identified tracts on TVA lands that are ecologically significant but not specifically managed by TVA's Natural Areas program.

### 3.11.1 Affected Environment

A review of the TVA RNHD (TVA 2022d) identified four managed and natural areas within 3 miles of the Project Area: Cherokee Reservoir Reservation, Crockett Spring Park and Arboretum, Ebbing and Flowing Spring, and DCH for the purple bean (Figure 3.11-1). The Crockett Spring Park and Arboretum, Ebbing and Flowing Spring, and DCH for the purple bean are 2.5 miles or greater from the Project Area. The DCH for the purple bean is upstream of the project site and would not be affected by the proposed action.

The Cherokee Reservoir Reservation is a popular recreation destination with campgrounds and hiking trails, is partially located within the Project Area (TVA 2022a). One developed water-based outdoor recreation area is located within 5 river miles downstream from the JSF Dam, a TVA-maintained public boat launching ramp located approximately 1 mile downstream from JSF Dam. This ramp was developed by TVA in the 1970s. This boat ramp is utilized by the public for recreational fishing and bank fishing (TVA 2022a). Additionally, bank fishing is common along the banks of the Cherokee Reservoir adjacent to the boat launch ramp. Other outdoor recreation areas within proximity of the Project Area include McDonald Hills Golf Course (MHGC), located approximately 2 miles northwest of the JSF Dam Project Area on the north side of the John Sevier Detention Reservoir. MHGC was constructed in 1959, and is a public, 18-hole golf course. MHGC is located adjacent north of McKinney Chapel Road and is open year-round to golfers (MHGC2022).

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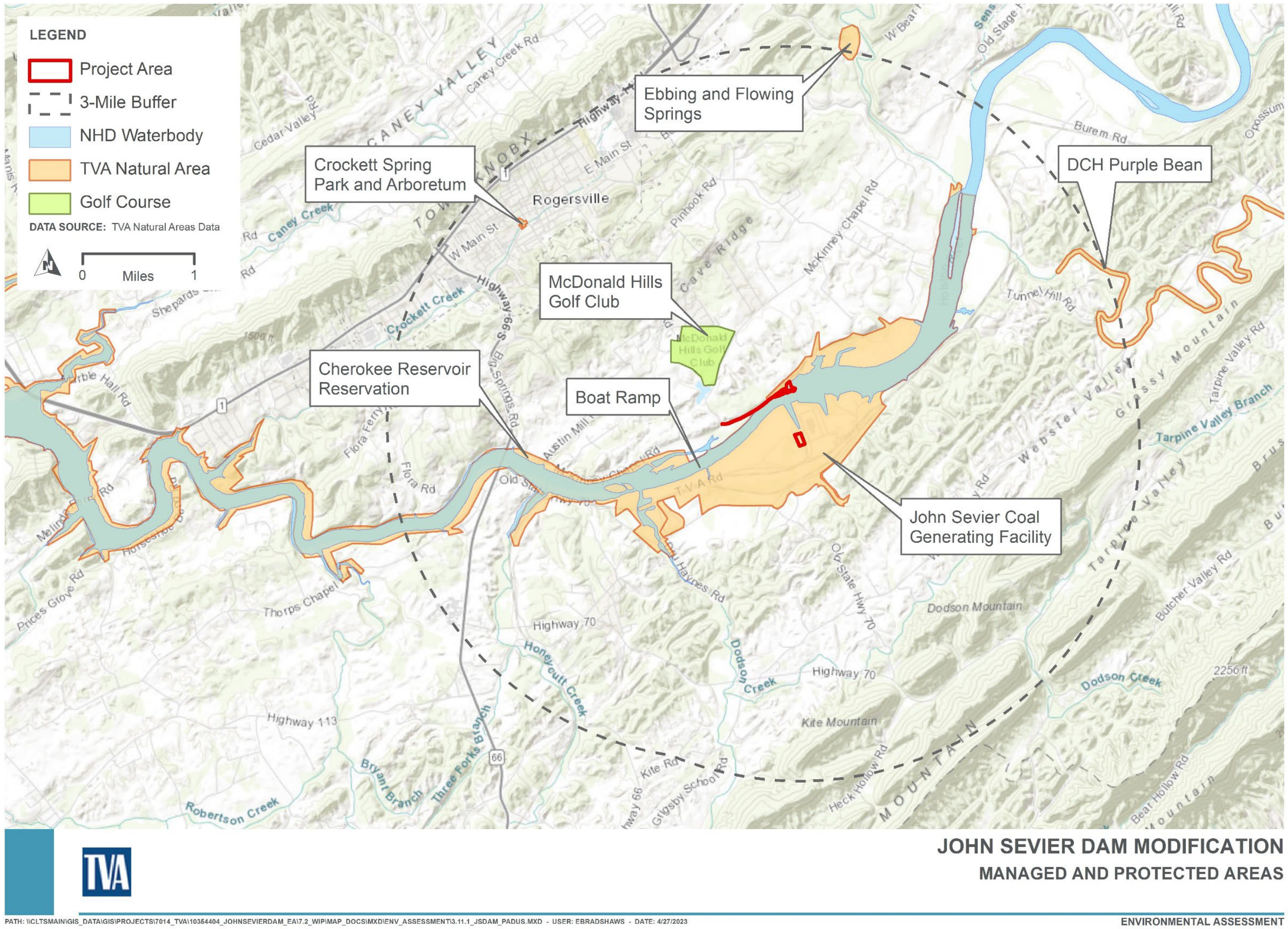


**Figure 3.11-1. Natural Areas, Parks, and Recreation near the JSF Dam Modification Project**

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## 3.11.2 Environmental Consequences

### 3.11.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. During maintenance there would be the potential minor direct temporary impacts on the Cherokee Reservoir but no direct impacts to other managed or natural areas. Direct impacts would include construction noise, visual intrusions, and runoff, which would be minimized through the use of standard construction BMPs. Indirect impacts could include intermittent noise and transportation effects to these recreational areas. Noise and transportation effects would be minimized through the use of standard construction BMPs.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment could result in the potential migration of mercury laden sediment downstream of the dam. This could result in large adverse impacts to natural areas, such as Cherokee Reservoir and recreation areas downstream of the dam (i.e., boat launch ramp and bank recreation fishing). The DCH for the purple bean is upstream of the project site and would not be affected as a result of dam failure. Crockett Spring Park and Arboretum, Ebbing and Flowing Springs, and McDonalds Hills Golf Club are not located on the river; thus, they would likely not be affected by potential downstream migration of mercury laden sediment. However, potential impacts to users of these areas may occur due to increased traffic volumes should cleanup or remediation be required if the dam failed. Cumulative effects may occur depending on the extent of impacts in the event of dam failure.

### 3.11.2.2 Alternative B

Under Alternative B, there would be minor direct impacts on the Cherokee Reservoir but no direct impacts to other managed or natural areas. Alternative B expands the footprint of the embankment in the downstream direction. Indirect impacts could occur on the Cherokee Reservoir. These direct impacts would include construction noise, visual intrusions, and runoff, which would be minimized through the use of standard construction BMPs. Due to the nature of the project and implementation of BMPs and coordination with federal and state agencies to obtain appropriate permits, temporary and minor impacts to these natural areas are expected. Cumulative effects are not anticipated.

The modification of the JSF Dam would not result in direct impacts to recreation. Indirect impacts could occur on the recreational areas within 1 mile of the Project Area, as well as to the MHGC located approximately 2 miles northwest of the Project Area off McKinney Chapel Road during construction activities (see Figure 3.11-1). Indirect impacts could include intermittent noise and transportation effects to these recreational areas. Noise and transportation effects would be minimized through the use of standard construction BMPs. Due to the limited extent of the Project Area temporary and minor impacts to these recreational areas are expected. The Project is expected to result in long-term beneficial impacts to recreation by preventing mercury laden sediments from potentially migrating and altering water quality downstream from the dam.

### 3.11.2.3 Alternative C

The impacts of Alternative C would be very similar to those of Alternative B. Temporary and minor indirect impacts to recreational areas and natural areas from increased noise and transportation effects during construction, which would be similar between Alternatives B and C. No direct impacts to recreation are anticipated and cumulative effects are not expected. The Project is expected to result in long-term beneficial impacts to recreation by preventing mercury laden sediments from potentially migrating and altering water quality downstream from the dam. Cumulative effects are not anticipated.

## 3.12 Air Quality

### 3.12.1 Affected Environment

Air quality is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter. Air quality is not only determined by the types and quantities of atmospheric pollutants but also by surface topography, size of the air basin, and prevailing meteorological conditions. Through its passage of the Clean Air Act of 1963 (CAA) and its amendments, Congress has mandated the protection and enhancement of our nation's air quality. The USEPA has established both primary and secondary National Ambient Air Quality Standards (NAAQS) for certain pollutants under the provisions of the CAA. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect the public welfare (i.e., soils, vegetation, and wildlife) from any known or anticipated adverse effects from a criteria air pollutant. NAAQS currently are established for six air pollutants (known as "criteria air pollutants"), including carbon monoxide (CO), nitrogen dioxide ($NO_2$), ozone ($O_3$), sulfur dioxide ($SO_2$), lead (Pb), and PM equal to or less than 10 microns (µm) in aerodynamic diameter ($PM_{10}$). While $O_3$ is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered as an air pollutant when calculating emissions because $O_3$ typically is not emitted directly from most emission sources. $O_3$ is formed in the atmosphere from its precursors, $NO_2$ and volatile organic compounds (VOCs), which are directly emitted from various emission sources. For this reason, $NO_2$ and VOCs are commonly reported in an air emissions inventory instead of $O_3$.

The CAA requires each state to adopt regulatory requirements necessary to attain the NAAQS. The CAA also allows states to adopt air quality standards that are more stringent than the federal standards. The USEPA classifies the air quality within an air quality control region (AQCR) according to whether the concentrations of criteria air pollutants in the atmosphere exceed primary or secondary NAAQS. All areas within each AQCR are assigned a designation of "attainment" or "non-attainment" for each criteria air pollutant. An attainment designation indicates that air quality within specific areas of an AQCR is as good as, or better than, NAAQS for individual criteria air pollutants or that the air quality is unclassified. A designation of "unclassified" indicates that air quality within an area cannot be classified and therefore is treated as attainment. A non-attainment designation indicates that the concentration of an individual criteria air pollutant at a specific location exceeds primary or secondary NAAQS.

Hawkins County is designated an "attainment" area for all criteria air pollutants (USEPA 2022a). Air emissions occur in the project vicinity from ongoing operations at JCC Plant. The primary mechanisms for causing potential effects to local air quality considered in this assessment are the demolition of part of the JSF Dam and construction-related activities. Both activities generate fugitive dust, which is commonly measured by the size of PM. A common unit of measure for dust is $PM_{10}$ (PM less than 10 µm in diameter). Likewise, exhaust from internal combustion engines used to power trucks and demolition equipment can affect local air quality, especially if the engines are not maintained in proper working condition. None of the alternatives evaluated in this EA would result in new operational air emissions sources at JSF Dam after construction is complete.

## 3.12.2 Environmental Consequences

### 3.12.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities could result in minor temporary impacts to air quality associated with fugitive dust and equipment emissions.

The possibility of dam failure may indirectly impact air quality surrounding the Project Area due to increased vehicles and fugitive dust if cleanup/mitigation efforts are required on-site. Otherwise, failure of the right dam embankment would not cause any temporary or permanent direct changes to air quality, and cumulative effects are not anticipated under Alternative A.

### 3.12.2.2 Alternative B

Alternative B involves demolition, excavation and other construction activities that could create fugitive dust emissions during the construction phase.

Vehicular traffic over paved and unpaved roads at the Project Area would result in the emission of fugitive dust during demolition, excavation, and other construction activities. Truck traffic would include delivery of construction materials (grout, cement, concrete, earthfill, filter materials and riprap) and removal of construction debris. Approximately 23,000 cy of materials (concrete, earthfill, filter materials and riprap) are expected to be hauled to the Project Area, requiring up to 75 truckloads per day over the construction duration of 7 to 8 months.

Construction materials stored in outdoor piles that are exposed to wind erosion is another source of fugitive dust. Note the size of the riprap needed for the spillway is 2 ft in diameter, which is too large to significantly contribute to fugitive dust. Backfilling and grading activities associated with Alternative B would create fugitive dust due to the movement of construction materials and the trucks and other mobile equipment performing these activities.

All grout needed for Alternative B would be batched on-site from cement and admixture materials hauled to the Project Area. The storage and mixing of these materials on-site could create fugitive dust emissions. The concrete for the training wall would be batched off-site, so there are no fugitive dust emissions from on-site concrete mixing associated with Alternative B.

In addition to fugitive dust created by demolition, excavation and construction activities, mobile equipment used for these activities emit nitrogen oxides ($NO_x$), CO, VOC, $SO_2$, $PM_{10}$, $PM_{2.5}$ (PM less than 2.5 μm in diameter), and carbon dioxide ($CO_2$).

Fugitive emissions from demolition activities typically produce particles that are primarily deposited on the property where the structures being demolished are located. Based on the large size of the TVA John Sevier Reservation, this is likely the case. The potential drift distance of particles is governed by the release point of the particle, the settling velocity of the particle, and the degree of atmospheric turbulence. The largest fraction (greater than 95 percent by weight) of fugitive dust emissions would be deposited within the boundary of the John Sevier Reservation (Buonicore and Davis 1992). The remaining fraction of the dust would be subject to transport beyond the reservation property boundary.

Theoretical drift distance, as a function of particle diameter and mean wind speed, has been computed for fugitive dust emissions. Results indicate that, for a typical mean wind speed of 10 miles per hour [mph], particles larger than about 100 µm are likely to settle out within 20 to 30 ft from the edge of the road or other point of emission. Particles that are 30 to 100 µm in diameter are likely to undergo slower settling. These particles, depending upon the extent of atmospheric turbulence, are likely to settle within a few hundred ft from the road. Smaller particles, particularly $PM_{10}$, and $PM_{2.5}$ have much slower settling velocities and are much more likely to have their settling rate reduced by atmospheric turbulence" (USEPA 1995).

The demolition and construction contractors would be required to implement dust control measures during demolition and construction activities to prevent the spread of dust, dirt, and debris. These methods may include but would not be limited to wetting demolition areas, covering waste or debris piles, using covered containers to haul waste and debris, and wetting unpaved vehicle access routes during hauling. Wet suppression can reduce fugitive dust emissions from roadways and unpaved areas by as much as 95 percent. TVA would also enforce vehicle speed restrictions on the on-site haul roads to minimize road dust. Additionally, TVA routinely requires onsite contractors to maintain engines and equipment in good working order to improve fuel efficiency and reduce potential CO emissions from poorly operating engines and equipment. TVA would also enforce a no-idle policy for vehicles on-site, to the extent practicable. With these measures in place, potential effects to local air quality from the proposed construction activities are expected to be minor and temporary.

Potential effects to local air quality from the proposed construction activities are expected to be minor and temporary. After completion of the rockfill spillway, and stabilization of the Project Area, all equipment and personnel would be demobilized from the Project Area. The areas disturbed during construction would be stabilized with permanent vegetation, which helps to minimize fugitive dust from bare soil in the long term. Alternative B would not cause any long-term direct or indirect changes to local air quality. The temporary minor impacts to local air quality are expected to be limited to the immediate area of the construction access road and the area of construction activities. Due to the large size of the TVA John Sevier Reservation, most of the fugitive dust generated is expected to remain on-site and not impact surrounding areas. As such, cumulative effects are not anticipated under Alternative B.

#### 3.12.2.3 Alternative C

The air quality impacts of Alternative C are similar to Alternative B. Like Alternative B, fugitive emissions would be caused by vehicular traffic over paved and unpaved roads at the Project Area during demolition, excavation, and other construction activities associated with Alternative C. While the construction material types and quantities would be different, both Alternatives B and C would have fugitive emissions from the delivery and storage of construction materials. Approximately 11,000 cy of concrete are expected to be hauled to the Project Area, requiring up to 75 truckloads per day over the 7-to-8-month project duration. The fugitive emissions from demolition activities are expected to produce particles that are primarily deposited in the construction area.

Like Alternative B, mobile equipment used for demolition, excavation and construction activities in Alternative C activities would generate combustion-related emissions of $NO_x$, CO, VOC, $SO_2$, $PM_{10}$, $PM_{2.5}$, and $CO_2$.

The demolition and construction contractors would be required to implement dust control measures during demolition and construction activities to prevent the spread of dust, dirt, and debris. TVA requirements for contractors to maintain engines and equipment in good working order to reduce CO emissions also apply for Alternative C.

Potential effects to local air quality from the proposed construction activities are expected to be minor and temporary. After completion of the spillway, all equipment and personnel would be demobilized from the Project Area. The areas disturbed during construction would be stabilized with permanent vegetation, which helps to minimize fugitive dust from bare soil in the long term. Alternative C would not cause any long-term direct or indirect changes to local air quality. The short-term impacts to local air quality are expected to be limited to the immediate area of the construction access road and the construction activities. Due to the large size of the TVA John Sevier Reservation, most of the fugitive dust generated is expected to remain on-site and not impact surrounding areas. Cumulative effects are not anticipated under Alternative C.

## 3.13 Greenhouse Gas and Climate Change

### 3.13.1 Affected Environment

The USEPA defines climate change as "any significant change in the measures of climate lasting for an extended period of time." In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, which occur over several decades or longer. These changes are caused by a number of natural factors as well as anthropogenic (i.e., human-related) activities (USEPA 2022c).

Climate change is primarily a function of excessive $CO_2$ in the atmosphere. $CO_2$ is the primary GHG emitted through human activities. Activities associated with the proposed action that produce $CO_2$ are primarily related to emissions from fossil-fuel-powered equipment (e.g., bulldozers, loaders, haulers, trucks, generators) used during the proposed activities. Forested areas that absorb and store $CO_2$ from the atmosphere via a process known as carbon sequestration help to reduce levels of $CO_2$ in the atmosphere. Additional GHGs that contribute to climate change include hydrofluorocarbons used in refrigeration equipment; sulfur hexafluoride used as a gaseous dielectric medium for high-voltage (1-kilovolt and above) circuit breakers, switchgears, and other electrical equipment; and methane. These gases can be released to the atmosphere through seal leaks, especially from older equipment, as well as during equipment manufacturing, installation, servicing, and disposal (USEPA 2022c).

On January 20, 2021, President Joe Biden issued EO 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis." The EO emphasized the need for federal agencies to accurately capture the cost of GHG emissions, including global damages. EO 13990 established an Interagency Working Group on the Social Cost of Greenhouse Gases (IWG 2021). This working group was tasked with publishing and advising on the monetized damages associated with incremental increases in GHG emissions, otherwise known as "social costs" (EO 13990). These social costs take into account factors such as changes in agricultural productivity, human health, flood risk, and ecosystem services.

In 2016, the Council on Environmental Quality (CEQ) issued a guidance memorandum to assist Federal agencies in considering the effects of GHG emissions when evaluating proposed Federal actions in accordance with NEPA. This guidance recommends that agencies quantify GHG emissions when possible, and if data is not available, to include a qualitative analysis in the NEPA document. The extent of the GHG analysis should align with the quantity of projected emissions (CEQ 2023). In this specific project, a detailed quantification of social costs is not necessary given the limited GHG emissions associated with the project.

## 3.13.2 Environmental Consequences

### 3.13.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment; however, maintenance alone would not address the risks identified in the 2019 JSF Dam risk assessment. Maintenance of the dam would likely generate combustion related GHG emissions (mainly $CO_2$, methane [$CH_4$], and $N_2O$) due to operation of mobile equipment use in maintenance activities. Emissions from mobile equipment would be intermittent and short-term; therefore, impacts to the global climate are expected to be minor and temporary.

Under Alternative A, minor temporary effects to GHGs would occur from increased construction-related vehicle traffic during maintenance activities. No demolition or construction activities would occur due to TVA actions under Alternative A.

The possibility of dam failure may impact GHG emissions surrounding the Project Area due to increased vehicles if cleanup/mitigation efforts are required on-site. Otherwise, failure of the right dam embankment would not cause any short-term or long-term direct or indirect changes to GHGs, and cumulative effects are not anticipated under Alternative A.

### 3.13.2.2 Alternative B and Alternative C

Under both Alternative B and Alternative C, mobile equipment used for demolition, excavation and construction activities would generate combustion related GHG emissions (mainly $CO_2$, $CH_4$ and $N_2O$). TVA routinely requires on-site contractors to maintain engines and equipment in good working order to improve fuel efficiency, which would reduce potential GHG emissions. Emissions from this equipment would be intermittent and short-term. Therefore, impacts to the global climate are expected to be minor and temporary for both Alternative B and Alternative C.

Extreme weather events and rising water levels have been linked to climate change. The modifications to the JSF Dam proposed in Alternatives B and C would make the dam more resilient and less likely to fail during an extreme weather event.

# 3.14 Noise and Vibration

## 3.14.1 Affected Environment

### 3.14.1.1 Noise

Noise is unwanted or unwelcome sound that is usually caused by human activity and added to the natural acoustic setting of a locale. It is further defined as sound that disrupts normal activities and diminishes the quality of the environment. Community response to noise is dependent on the intensity of the sound source, its duration, the proximity of noise-sensitive land uses, and the time of day the noise occurs.

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

The day-night sound level (Ldn) is the 24-hour equivalent sound level, which incorporates a 10 dBA correction penalty for the hours between 10 p.m. and 7 a.m. to account for the increased sensitivity of people to sounds that occur at night. Typical background day-night noise levels for rural areas are anticipated to range between an Ldn of 35 and 50 dB, whereas higher-density residential and urban areas background noise levels range from 43 dB to 72 dB (USEPA 1974). Background noise levels greater than 65 dBA can interfere with normal conversation, watching television, using a telephone, listening to the radio, and sleeping. Common indoor and outdoor noise levels from various noise sources are listed in Table 3.14-1.

Ambient noise surrounding the JSF Dam would originate from the nearby Norfolk Southern rail line and JCC Plant. Other noise sources near the Project Area would include water flowing over the dam; boat traffic; agricultural sounds, such as noises from farm machinery; and natural sounds, such as from wind and wildlife. Generally, the area surrounding the JSF Dam is primarily rural residential, agricultural, suburban, and undeveloped land. However, due to the nearby JCC plant and rail line, noise levels at the JSF Dam are likely to be higher than typical rural areas at approximately 43 dB to 72 dB.

There are no buildings or residential structures that would be sensitive to noise within 500 ft of the Project Area. The nearest sensitive receptors are approximately 0.80 miles from the Project Area.

**Table 3.14-1. Common Indoor and Outdoor Noise Levels**

| Common Outdoor Noises | Sound Pressure Levels (dB) | Common Indoor Noises |
|---|---|---|
| | 110 | Rock Band at 5 meters (16.4 feet) |
| Jet Flyover at 300 meters (984.3 feet) | | |
| | 100 | |
| | | Inside Subway Train (New York) |
| Gas Lawn Mower at 1 meter (3.3 feet) | | |
| | 90 | |
| Diesel Truck at 15 meters (49.2 feet) | | Food Blender at 1 meter (3.3 feet)<br>Garbage Disposal at 1 meter (3.3 feet) |
| | 80 | |
| | | Shouting at 1 meter (3.3 feet) |
| Gas Lawn Mower at 30 meters (98.4 feet) | 70 | Vacuum Cleaner at 3 meters (9.8 feet) |
| Commercial Area | | Normal Speech at 1 meter (3.3 feet) |
| | 60 | |
| | | Large Business Office |
| | 50 | Dishwasher Next Room |
| Quiet Urban Daytime | | |
| Quiet Urban Nighttime<br>Quiet Suburban Nighttime | 40 | Small Theater, Large Conference Room<br>Library |
| | 30 | |
| Quiet Rural Nighttime | | Bedroom at Night<br>Concert Hall (Background) |
| | 20 | |
| | | Broadcast and Recording Studio |
| | 10 | |
| | | Threshold of Hearing |
| | 0 | |

Source: American Association of State Highway and Transportation Officials (AASHTO) 1993

### 3.14.1.2 Vibration

Construction and demolition activities, including the operation of heavy machinery and construction-related vehicles, can create ground vibration. Community response to ground vibration is dependent on the intensity of the vibration source, its duration, distance between the source and receptor, and whether the vibration is continuous or transient. Continuous vibration sources include most heavy machinery and construction-related vehicles, whereas transient vibration sources include single isolated events such as blasting. Ground vibrations can cause annoyance to people who live or work near sources of vibration. Additionally, if the vibration amplitudes are high enough, there is the possibility of physical and cosmetic damage to structures.

Ground vibration is measured in terms of peak particle velocity (PPV) in units of inches per second (in/sec). Continuous and transient vibration criteria for structural damage and human annoyance are listed in Table 3.14-2 and Table 3.14-3, respectively. The threshold at which there is a risk to older residential structures is 0.3 in/sec PPV from continuous vibrations and 0.5 in/sec PPV from transient vibrations. Vibration levels would become distinctly perceptible at 0.04 in/sec PPV from continuous vibrations and 0.25 in/sec PPV from transient vibrations (Caltrans 2020). Table 3.14-4 presents typical levels of ground-borne vibration at 25 ft for a variety of common construction equipment. Ground vibration generated by most construction equipment would be approximately 0.2 in/sec PPV or less at 25 ft, decreasing to a distinctly perceptible 0.04 in/sec PPV at 125 ft. For typical pile driving activities, ground vibration would decrease to a distinctly perceptible 0.04 in/sec PPV at 400 ft (FTA 2006).

**Table 3.14-2. Vibration criteria for structural damage**

| Structure and Condition | Maximum Vibration Level (in/sec PPV) | |
|---|---|---|
| | Transient Sources | Continuous/Frequent Intermittent Sources |
| Extremely fragile historic buildings, ruins, ancient monuments | 0.12 | 0.08 |
| Fragile buildings | 0.2 | 0.1 |
| Historic and some old buildings | 0.5 | 0.25 |
| Older residential structures | 0.5 | 0.3 |
| Newer residential structures | 1.0 | 0.5 |
| Modern industrial/commercial buildings | 2.0 | 0.5 |

Source: Caltrans 2020

**Table 3.14-3. Vibration criteria for human annoyance**

| Human Response | Maximum Vibration Level (in/sec PPV) | |
|---|---|---|
| | Transient Sources | Continuous/Frequent Intermittent Sources |
| Barely perceptible | 0.04 | 0.01 |
| Distinctly perceptible | 0.25 | 0.04 |
| Strongly perceptible | 0.9 | 0.1 |
| Severe | 2.0 | 0.4 |

Source: Caltrans 2020

**Table 3.14-4. Vibration source levels for construction equipment**

| Equipment | Maximum Vibration Level (in/sec PPV) |
|---|---|
| Pile driver | 0.5 |
| Vibratory roller | 0.2 |
| Large bulldozer | 0.09 |
| Caisson drilling | 0.09 |
| Loaded trucks | 0.08 |
| Jackhammer | 0.04 |
| Small bulldozer | <0.01 |

Sources: FTA 2006; Caltrans 2020

## 3.14.2 Environmental Consequences

### 3.14.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would vary in scope and duration; however, overall, construction noise would cause temporary, minor impacts to the ambient sound environment in the vicinity of the dam.

The possibility of dam failure may temporarily increase noise and vibrations in the Project Area due to the dam failure event and then from increased vehicle traffic and site activity associated with cleanup and mitigation efforts, as needed.

Otherwise, the proposed maintenance of the dam under Alternative A, depending on maintenance activity, may result in minor and temporary direct impacts to ambient noise or vibration levels. However, maintenance activities would not be expected to result in permanent direct or indirect changes to ambient noise levels or vibration, and cumulative effects are not anticipated under Alternative A.

### 3.14.2.2 Alternative B

Subject to weather, Alternative B construction activities would take approximately 7 to 8 months to complete using a crew of approximately 30 workers maximum. Work would generally occur during daylight hours, 5 days a week. During construction, noise would be generated by haul trucks, heavy equipment, and drill rigs coring through rock for grout curtain installation. Typical maximum noise levels from construction equipment are expected to be 95 dBA or less at a distance of 50 ft (USDOT 2006; Table 3.14-5). These noise levels would typically diminish with distance from the dam at a rate of approximately 6 dBA per each doubling of distance. According to aerial imagery, the nearest residences are approximately 0.80 miles from the dam and are located upslope from the dam, and the slope consists of woody vegetation that would attenuate noise. Based on straight line noise attenuation, it is estimated that noise levels from these sources would attenuate to approximately 60 dBA or less at the nearest residences along McKinney Chapel Road. These noise levels are below the U.S. Department of Housing and Urban Development (USHUD) guideline of 65 dBA, but greater than the USEPA guideline of 55 dBA.

**Table 3.14-5. Maximum noise levels at 50 ft for common construction equipment**

| Equipment | Maximum Noise Level at 50 ft (dBA) |
|---|---|
| Air compressor | 80 |
| Auger drill rig | 85 |
| Backhoe | 80 |
| Boring jack power unit | 80 |
| Bulldozer | 85 |
| Compactor (ground) | 80 |
| Concrete truck | 85 |
| Excavator | 85 |
| Impact Pile Driver | 95 |
| Jackhammer | 85 |
| Vibratory Pile Driver | 95 |

Source: USDOT 2006

Construction equipment and material delivery and waste removal would require up to 75 trucks or other large vehicles visiting the Project Area each day during the construction period, resulting in increased noise levels along McKinney Chapel Road. Overall, construction noise would cause temporary, minor impacts to the ambient sound environment in the vicinity of the dam. Due to the industrial uses of the Project Area, and distances to the nearest residential receptors, construction-related noise and vibration impacts would be minor and barely perceptible; as such, no cumulative effects would occur.

Vibrations from heavy machinery use and most construction activities would be temporary and minor, and due to the distance to the nearest receptors (approximately 0.8 mi), would not cause structural or cosmetic damage or be perceptible to members of the community. As such, no cumulative effects from vibrations would occur.

#### 3.14.2.3 Alternative C

Subject to weather, Alternative C construction activities would take approximately 7 to 8 months to complete using a crew of approximately 30 workers maximum. Work would generally occur during daylight hours, 5 days a week; however, if RCC placement occurs during summer months, placement may require extended hours and may occur at night due to elevated summer temperatures. During construction, noise would be generated by haul trucks, heavy equipment, drill rigs coring through rock for grout curtain installation, and excavators jack hammering rock in the footprint of the RCC gravity dam and stilling basin. Noise and vibration effects from Alternative C would be temporary and minor, and similar to those identified above under Alternative B. Cumulative effects are not anticipated.

## 3.15 Transportation

### 3.15.1 Affected Environment

The JCC Plant is served by railway and highway modes of transportation. A Norfolk Southern rail line extends north-south through the southern portion of the JCC reservation near the community of McCloud. Tennessee State Route (SR) 66 and SR 70 provide access via McKinney Chapel Road to the JSF Dam. SR 66 and SR 70 are high-quality, rural roadways with a shoulder. Access from Interstate 81 from the west is via SR 66 northeast to SR 70 east to JSF Dam. Access from Interstate 81 from the east is via SR 70 north to JSF Dam. Direct access to the Project Area at the north end of JSF Dam is via McKinney Chapel Road and a gravel access road east to the Dam. Existing road conditions along McKinney Chapel Road were documented photographically by TVA staff on July 11, 2023 (see Appendix C). Table 3.15-1 shows the 2021 average annual daily traffic counts (TDOT 2022a).

**Table 3.15-1. 2021 Average Annual Daily Traffic Counts on Major Roadways Near JSF**

| Station | Roadway | Distance from JSF Dam Project Area (miles) | AADT[1] |
|---|---|---|---|
| 97 | McKinney Chapel Rd | 0.5 mile west | 818 |
| 74 | SR 66 (South of Holston River) | 2.4 miles west | 11,113 |
| 37 | SR 66 (North of Holston River) | 3.4 miles northwest | 11,793 |
| 66 | SR 66 (South of W Main St) | 4.0 miles northwest | 15,176 |
| 133 | SR 70 (East of SR 66) | 4.2 miles southwest | 3,196 |
| 57 | SR 113 (West of SR 66) | 4.6 miles southwest | 2,666 |

Source: TDOT 2022a
1 AADT = Average Annual Daily Traffic

## 3.15.2 Environmental Consequences

### 3.15.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Affects to transportation would vary according to the scope and duration of maintenance activities. Maintenance of the dam would likely result in minor direct impacts to road traffic due to an increase in construction related traffic in the Project Area vicinity.

The possibility of dam failure has the increased risk of impacting transportation to the Project Area if cleanup/mitigation efforts are required on-site. The periodic maintenance activities that would be anticipated under Alternative A would not result in adverse impacts or cumulative effects to transportation. Existing transportation network and traffic conditions would be expected to remain as they are at present, and no cumulative effects would occur.

### 3.15.2.2 Alternative B

Under Alternative B, the riprap armoring and spillway modifications to the JSF Dam would result in minor direct impacts to road traffic due to an increase in construction related traffic in the Project Area vicinity. Subject to weather, construction activities would take approximately 7 to 8 months to complete using a crew of approximately 30 workers maximum. Work would generally occur during daylight hours for 5 days a week. A majority of these workers would likely come from the local area or region. Other workers could come from outside the region, and if so, many would likely stay in local hotels in the vicinity. It is anticipated that workers would drive personal vehicles to the Project Area. Some of the individual workers and work teams would likely visit local restaurants and other businesses during the construction phase of the project.

Due to the proximity of JSF Dam to the town of Rogersville, possible minor to moderate traffic impacts along McKinney Chapel Road, SR 66, and SR 70 could occur, as a portion of the construction workers would likely commute to the Project Area from and through Rogersville. Traffic flow around the Project Area would be heaviest at the beginning of the workday, at lunch, and at the end of the workday.

Construction equipment and material delivery and waste removal would require up to 75 trucks or other large vehicles visiting the Project Area each day during the construction period. These vehicles should be easily accommodated by existing roadways. Existing road conditions along McKinney Chapel Road were photographically documented by TVA on July 11, 2023 (see Appendix C). Prior to initiating construction activities, TVA would perform a more detailed pre-construction survey to document existing road conditions along McKinney Chapel Road. During construction, TVA would monitor McKinney Chapel Road for deteriorating conditions associated with large equipment travel related to the proposed project.

Should traffic congestion occur during construction, use of one or more avoidance and minimization measures, such as posting a flag person during heavy commute periods to manage traffic flow, prioritizing access for local residents, or implementing staggered work shifts during daylight hours, would minimize potential adverse impacts to traffic and transportation to minor or negligible levels. Therefore, only minor impacts to transportation resources in the Project Area would be anticipated as a result of worker and construction vehicle activity.

Overall, direct impacts to transportation resources associated with implementation of Alternative B would be anticipated to be minor to moderate during construction due to workers and trucks traveling to and from the Project Area. These impacts would be temporary and minimized through appropriate mitigation if necessary. Cumulative effects are not anticipated unless construction periods of other, unrelated projects in the area overlap with the construction period of Alternative B; however, this is not anticipated.

#### 3.15.2.3 Alternative C

Under Alternative C, the development of the RCC and spillway modifications to the JSF Dam would result in temporary minor to moderate direct impacts to road traffic due to an increase in construction related traffic in the vicinity of the Project Area similar to impacts identified under Alternative B. Similar to Alternative B, construction equipment and material delivery and waste removal would require up to 75 trucks or other large vehicles visiting the Project Area each day during the construction period.

Subject to weather, construction activities would take approximately 7 to 8 months to complete using a crew of approximately 30 workers maximum. Work would generally occur during daylight hours for 5 days a week; however, RCC placement may require extended hours and may occur at night during summer months due to temperatures.

Overall, minor to moderate direct impacts to transportation resources associated with implementation of Alternative C would be anticipated to be comparable to those associated with Alternative B. Cumulative effects are not anticipated unless construction periods of other, unrelated projects in the area overlap with the construction period of Alternative B; however, this is not anticipated.

## 3.16 Navigation

### 3.16.1 Affected Environment

This section includes an assessment of navigation as defined as the ability of a boat, kayak, or other type of watercraft to get from one place to another in the Project Area. The JSF Dam is a run of river dam, located on a reach of the Holston River and on the upper end of the Cherokee Reservoir, north of the JCC facilities. The Cherokee Reservoir at JSF Dam does not have interstate or foreign commerce, i.e., the dam does not have a navigation lock and is not considered a traditionally navigable waterway. Access to JSF Dam is restricted to TVA employees, and TVA has dangerous water signs placed approximately 100 to 250 ft downstream of the dam, and a dangerous water sign mounted on the upstream side of the dam near the left bank warning boaters. However, no physical barriers are provided to restrict boater access due to Tennessee right to fish laws.

### 3.16.2 Environmental Consequences

#### 3.16.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. The Cherokee Reservoir downstream of JSF Dam does not have interstate or foreign commerce and is not considered a traditionally navigable waterway; as such, only recreational boat traffic occurs in this area. There would be minor temporary effects on recreational boaters in the Project Area which would be minimized through the use of reflective tape and lighting at night and based on the short duration of the repair and maintenance activities.

No impacts are anticipated from periodic maintenance activities that may be required to maintain the JSF Dam. However, should a dam failure occur, there would be large direct and indirect impacts to downstream navigation. The duration of impacts to navigation would be dependent on the extent of downstream flooding and sedimentation from a potential dam failure and would be expected to have cumulative effects to navigation within the impacted reach of the Cherokee Reservoir.

#### 3.16.2.2 Alternatives B and C

The Cherokee Reservoir downstream of JSF Dam does not have interstate or foreign commerce and is not considered a traditionally navigable waterway; as such, only recreational boat traffic occurs in this area. Under both Alternatives B and C, reflective tape and lighting of barges or other equipment extending into the river, including the floating debris boom, during construction would be advised for nighttime visibility of recreational boaters. There would be minor temporary effects on recreational boaters in the Project Area which would be minimized through the use of reflective tape and lighting at night and based on the short duration of the construction activities. No cumulative effects are anticipated for either Alternative B or Alternative C.

## 3.17 Cultural Resources

Cultural resources include pre-contact and historic archaeological sites, districts, buildings, structures, and objects, as well as locations of important historic events that lack material evidence of those events. Cultural resources are considered historic properties if included in, or considered eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the NPS. The eligibility of a resource for inclusion in the NRHP is based on the Secretary of the Interior's criteria for evaluation (36 CFR §60.4), which state that significant cultural resources possess integrity of location, design, setting, materials, workmanship, feeling and association, and:

1. are associated with important historical events; or
2. are associated with the lives of significant historic persons; or
3. embody distinctive characteristics of a type, period, or method of construction or represent the work of a master, or have high artistic value; or
4. have yielded or may yield information (data) important in history or prehistory.

Because of their importance to the Nation's heritage, historic properties are protected by several laws. Federal agencies, including TVA, have a statutory obligation to facilitate the preservation of historic properties, stemming primarily from the National Historic Preservation Act (NHPA; 16 U.S.C. §§470 et seq.). Other relevant laws include the Archaeological and Historic Preservation Act (16 U.S.C. §§469-469c), Archaeological Resources Protection Act (16 U.S.C. §§470aa-470mm) and the Native American Graves Protection and Repatriation Act (25 U.S.C. §§3001- 3013).

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

Section 110 of the NHPA sets out the broad historic preservation responsibilities of federal agencies and is intended to ensure that historic preservation is fully integrated into their ongoing programs. Federal agencies are responsible for identifying and protecting historic properties and avoiding unnecessary damage to them. Section 110 also charges each federal agency with the affirmative responsibility for considering projects and programs that further the purposes of the NHPA, and it declares that the costs of preservation activities are eligible project costs in all undertakings conducted or assisted by a federal agency.

### 3.17.1 Affected Environment

Existing conditions for cultural resources are presented in the following discussion for the vicinity of the Alternatives.

In 2008, TVA in consultation with the Tennessee SHPO, determined the JSF Plant, including JSF Dam, to be eligible for inclusion in the NRHP as a historic district. The NRHP-eligible JSF property boundary contains 22 contributing elements including the powerhouse, office building, switchyard, detention dam, coal storage yard, and other structures that are integral to power production by coal combustion. The dam was reassessed in 2012 to support consultation related to the retirement and decommissioning of the JSF Plant (Karpynec et al. 2012). Through related consultation in 2013, TVA determined that the dam remained eligible for listing in the NRHP as a contributing element to the JSF Plant, and that the proposed decommissioning would result in an adverse effect on it. TVA developed and executed a Memorandum of Agreement to mitigate adverse effects to JSF through the completion of Historic American Engineering Record documentation and the installation of interpretive panels focused on the history and architecture of the JSF Plant and its significance to local, state, and regional history. TVA received concurrence from the Tennessee SHPO in September 2014 that the adverse effects of the project had been adequately mitigated. The dam was an original component of the design of the JSF Plant and a contributing resource to the NRHP-eligible JSF Plant historic district. Since the retirement and decommissioning of JSF Plant, the majority of the facility has been demolished, disassembled, or converted to support the adjacent JCC Plant. The JSF dam and switchyard are among the only remaining resources previously determined to be contributing to the JSF Plant historic district. TVA found in 2020 that the JSF dam was no longer eligible for listing in the NRHP as a contributing element of the JSF Plant. The SHPO concurred with that finding by letter dated February 13, 2020.

There have been several previous archaeological surveys completed within the Project Area and within 0.5 mile of the Project Area. These include McKee et al. (2008), McKee and Karpynec (2009), Gaffin at al. (2012), and Stallings et al. (2014). The majority of the archaeological sites within 0.5 mile were recorded during Gaffin et al.'s (2012) survey of 195 acres on the portion of the JSF Reservation along the right-descending bank of the Holston River. With the exception of the access road, Gaffin et al. (2012) surveyed the remaining area covered under the JSF Project Area footprint and no archaeological sites were identified within that footprint. The survey identified three archaeological sites that TVA and SHPO agreed are potentially eligible for inclusion in the NRHP. TVA agreed, in consultation with SHPO and the Tribes, that for any future actions with potential to affect those three sites, TVA would conduct additional studies to assess the eligibility of the sites and any potential effects on them, and would consult further with Tennessee SHPO, federally recognized Indian tribes, and other consulting parties. None of the sites are located within the affected area. Gage and Hermann (2009) surveyed an area adjacent to the proposed JSF Dam Project access road and identified one cultural resource (40HW337), which is located outside of the affected area.

There are no previously recorded archaeological sites within the footprint of Alternatives B and C. There are 10 recorded archaeological sites within 0.5 mile of the Project.

There are 14 previously recorded historic architectural resources within the half-mile buffer of the Project Area. However, 13 of these resources were found to be NRHP-eligible as contributing resources to the former JSF historic district, which has been mostly deconstructed and are now contributing elements to the JSF historic district, as described in JSF Plant Deconstruction Final EA (TVA 2015). Resource number HW-2935 is the former Bob McDonald House, which is no longer extant. The Bob McDonald House was a residential structure built in 1900 located on the north bank of the Holston River southwest of the proposed construction access road entrance off McKinney Chapel Road. No architectural resources listed in, or eligible for listing in, the NRHP are located in the affected area.

### 3.17.2 Environmental Consequences

#### 3.17.2.1 Alternative A

Under the No Action Alternative, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities required to maintain the current configuration of the right embankment, if limited to the Project Area, would not impact archeological or historic resources. Additional evaluations would potentially be required depending on the scope and area required for maintenance activities.

The possibility of dam failure is unlikely to increase the risk of impacting cultural resources, as the only identified archaeological site is located outside of the Project Area, at a sufficient distance downstream that flows from dam failure would not impact the site, and the dam itself is no longer considered eligible for listing in the NRHP. No impacts to archaeological and architectural resources near the Project Area are anticipated from Alternative A.

#### 3.17.2.2 Alternatives B and C

The only identified archaeological site in the vicinity of JSF Dam is 40HW337, which is located outside of the Project Area. Therefore, this site would not be affected by any activities associated with either alternative. Alternatives B and C would not affect any other archaeological sites. Alternative B and C would not affect any architectural resources; JSF Dam is ineligible for the NRHP and TVA has found that the proposed project is not a type of activity with potential for visual effects on historic architectural resources outside the project footprint.

Overall, no direct, indirect, or cumulative effects to cultural resources are anticipated due to the implementation of Alternatives B and C.

## 3.18 Visual Resources

### 3.18.1 Affected Environment

Visual resources compose the visible character of a place and include both natural and human-made attributes. Visual resources influence how an observer experiences a particular location and distinguishes it from other locations. Such resources are important to people living in or traveling through an area and can be an essential component of historically and culturally significant settings.

JSF Dam is located in a rural portion of Hawkins County, Tennessee, near the small community of McCloud. The surrounding topography ranges from gently sloping near the banks of the Holston River to moderately and steeply sloping ranges at Piney Mountain to the south and Town Knobs to the north. Dense forest is visible along the slopes leading up from the valley floor to the hilltops above. Agricultural operations, as well as scattered private residences and rural farmsteads, are visible toward the banks of the Holston River to the south. To the north, and slightly obscured from view, residential development increases in density northward to the nearby town of Rogersville.

There are no sensitive viewing receptors within the foreground (0.5 mi) of the JSF Dam Project Area. The JSF Dam could be viewed by recreational boaters and other users along the Holston River and those utilizing the John Sevier TVA Boat Ramp, approximately 1 mile downstream from the JSF Dam (Figure 3.11-1).

### 3.18.2 Environmental Consequences

#### 3.18.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would potentially temporarily alter the visual character of the JSF Dam. During construction, heavy machinery would be present, temporarily changing the visual aspects from vantage points along the Holston River, primarily from the John Sevier TVA Boat Ramp located downstream from the dam.

Minor temporary visual impacts would be anticipated from the proposed maintenance activities under Alternative A from equipment and vehicles being used on site during maintenance and repair activities. However; the possibility of dam failure may impact the appearance of the dam and may necessitate increased vehicles on-site if cleanup/mitigation efforts are required. Otherwise, failure of the right dam embankment would not cause any permanent direct or indirect changes to visual resources, and cumulative effects are not anticipated under Alternative A.

#### 3.18.2.2 Alternative B

Under Alternative B, additional riprap armoring would be constructed on the existing right embankment to act as a rockfill spillway. The added riprap armoring would change the appearance of the dam as the dam would have a large sloping expanse of rock riprap as shown in Figure 2.1-3 and Figure 2.1-4. Visual resource impacts on recreational boaters and the boat ramp observing JSF Dam would be minor, as these observations could be made only from a distance given restricted access in the vicinity of the dam. Boaters that are able to get closer to the dam while accessing the river may experience more of a visual impact and adverse visual impacts could also occur on roads in the vicinity of the Project Area from trucks or other large vehicles travelling on the local roadway network. However, there would be little to no adverse impacts to the scenic quality of the area.

Under Alternative B, construction activities would temporarily alter the visual character of the JSF Dam. During construction, heavy machinery would be present, temporarily changing the visual aspects from vantage points along the Holston River, primarily from the John Sevier TVA Boat Ramp located downstream from the dam.

Overall, impacts to visual resources anticipated due to the implementation of Alternative B include minor and temporary impacts during construction due to boater visibility on the Holston River and at the John Sevier TVA Boat Ramp. Cumulative effects are not anticipated.

#### 3.18.2.3 Alternative C

While many of the impacts of Alternative C on visual resources during construction would be similar to those of Alternative B, the appearance of the completed dam modifications would differ. Under Alternative C, the completed dam modifications would present a steeply sloping downstream extension of the north end of the dam composed of multiple layers of concrete, as illustrated in Figure 2.1-9 and Figure 2.1-10. Downstream of this would be a similar but shorter structure, separated from the upstream structure by a trough-like area. However, there would be little to no adverse impacts to the scenic quality of the area.

Overall, impacts to visual resources anticipated due to the implementation of Alternative C are comparable to those associated with Alternative B.

## 3.19 Solid and Hazardous Waste

### 3.19.1 Affected Environment

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

RCRA regulations define what constitutes a hazardous waste and establishes a “cradle to grave” system for management and disposal of hazardous wastes. Subtitle C of RCRA includes separate, less stringent regulations for certain potentially hazardous wastes. Used oil, for example, may be regulated as hazardous waste if it is disposed of, but it is separately regulated if it is recycled. Specific requirements are provided under RCRA for generators, transporters, processors, and burners of used oil that are recycled. Universal wastes are a subset of hazardous wastes that are widely generated. Universal wastes include batteries, lamps and high intensity lights, and mercury thermostats. Universal wastes may be managed in accordance with the RCRA requirements for hazardous wastes or by special, less stringent provisions.

Solid waste consists of a broad range of materials that include refuse, sanitary wastes, contaminated environmental media, scrap metals, nonhazardous wastewater treatment plant sludge, nonhazardous air pollution control wastes, various nonhazardous industrial waste, and other materials (solid, liquid, or contained gaseous substances). Solid waste is regulated by the USEPA and RCRA Subtitle D. Each state is required to ensure the federal regulations for solid waste are met and may implement more stringent requirements.

Special waste is a solid waste, other than a hazardous waste, which requires special handling and management to protect public health or the environment. In some states, special wastes may include sludges, bulky wastes, pesticide wastes, industrial wastes, combustion wastes, friable asbestos and certain hazardous wastes exempted from RCRA Subtitle C requirements. Any of these wastes, if generated, would be disposed as required by state and federal regulations. In Tennessee, requirements for solid wastes are focused on solid waste processing and disposal under Rule 0400-11-.01. Potential effects related to solid and hazardous waste of dam modification were considered.

The JCC Plant is considered a RCRA Very Small Quantity Generator of hazardous waste by TDEC. Discharge of wastewater to surface waters is authorized under individual NPDES Permit number TN0005436 and NPDES Industrial Storm Water General Permit number TNR053187 (see Section 3.4). Wastes generated at the JCC Plant include ignitable and metal wastes. TVA continues to manage the coal combustion residuals generated by the former JSF Plant. The coal combustion residuals management areas are on the south side of the river some distance from the site of the proposed JSF Dam modifications.

Based on a review of the TDEC Division of Remediation database, permitted Tennessee landfill sites, solid waste processors, transfer or convenience centers, and underground storage tanks (USTs) database accessed through the TDEC Data Viewer (TDEC 2022b) and the USEPA ECHO database (USEPA 2022b), no such regulated facilities occur within 0.5-mile of the JSF Dam.

### 3.19.2 Environmental Consequences

#### 3.19.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would likely generate typical construction debris and small volumes of solid waste which would be managed in accordance with applicable federal, state and local laws and regulations and TVA BMP procedures.

Internal erosion alone or that leads to a dam failure would have negative impacts to foundation soils under the right embankment and depending on the extent of leakage and erosion to the dam embankment. Further, Alternative A would result in an increased risk for large adverse environmental consequences associated with dam failure from overtopping erosion. Dam failure could have a large and long-term adverse effect downstream of the JSF Dam by resulting in the downstream migration of mercury laden sediments currently located upstream of the JSF Dam. Depending on the magnitude of dam failure and extent of downstream impacts from mercury laden sediments, large adverse and potentially large adverse cumulative effects to nearby resources could occur, as discussed in each resource section.

However, a potential dam failure caused by a failure of the right embankment is not anticipated to result in downstream mobilization of other sources of solid or hazardous wastes generated on the JSF Reservation.

#### 3.19.2.2 Alternative B

Under Alternative B, modification of the dam including excavation of soil and bedrock, foundation preparation, grouting, and construction of the training wall and rockfill spillway would generate typical construction debris and small volumes of solid waste. TVA would manage all solid wastes in accordance with applicable federal, state, and local laws and regulations and TVA BMP procedures. These wastes would be temporarily stored in properly managed storage areas on-site. Appropriate spill prevention, containment, and disposal requirements for hazardous wastes would be implemented to protect construction and plant workers, the public, and the environment as necessary if wastes are determined to be hazardous.

Demolition debris consisting of old riprap or excavated soils would be used as clean fill where not contaminated by hazardous materials. Contaminated demolition debris and hazardous wastes would be hauled by truck to a permitted waste disposal facility/landfill designed to receive such wastes. Once construction is completed, the generation of waste during operations would be similar to the current waste generation rates.

Any reportable spills and subsequent cleanup related to the Project would be addressed in accordance with the requirements outlined in the Project Spill Prevention, Control, and Countermeasures Plan and Waste Management Plan. Designated contractor and subcontractor personnel would be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced. Disposal containers such as dumpsters or roll-off containers would be obtained from a proper waste disposal contractor.

Alternative B would require the excavation of approximately 8,400 cy of soil downstream of the dam, which would be re-used as backfill, if possible, or disposed off-site. Soil contamination may result from at least two sources: hazardous material or fuel spills during construction and/or encountering pre-existing contaminated soils during construction. No areas of soil contamination have been identified within the proposed excavation footprint.

If contaminated or suspect soils are encountered during construction, TVA would adhere to measures which include, but are not limited to, taking immediate steps, if feasible, to isolate the contamination; stopping work activities in the immediate vicinity of the Project Area; making the appropriate internal and external notifications; determining appropriate sampling requirements; and coordinating for disposal of contaminated media, if necessary (based on analytical results). TVA would dispose of all waste in accordance with the Waste Management Plan. In addition, TVA would develop a SWPPP, which would incorporate the requirements of applicable federal and state permit conditions. Overall impacts from solid and hazardous waste generation and disposal would be minor.

#### 3.19.2.3 Alternative C

The impacts of construction debris and solid and hazardous waste generation and management under Alternative C would be very similar to those of Alternative B. The main difference would be from the disposition of approximately 700 cy of rock excavated on the downstream side of the dam. This rock would be re-used on-site, if possible, disposed off-site, or hauled to TVA-owned property at the JCC Plant for beneficial reuse. Overall impacts from solid and hazardous waste generation and disposal would be minor.

## 3.20 Utilities and Service Systems

### 3.20.1 Affected Environment

This section includes an assessment of the existing utility and service systems and an evaluation of Project-related impacts under each of the three alternatives. It is also necessary to discuss facilities that are not located within the proposed Project Area but that could be affected by utility relocations or interruptions because they currently share a common service line. This pertains specifically to the JCC Plant.

The JSF Dam previously provided cooling water for the JSF Plant which was retired in 2014 and has since been deconstructed. The dam now provides a reservoir of water for use at the JCC Plant located on the south side of the river. The JCC Plant intake withdraws water from the John Sevier Detention Pool at an estimated current maximum withdrawal of about 11.16 cfs (7.21 MGD). The maximum discharge from the JSF Dam is 229,000 cfs.

Water service in the Project Area vicinity is provided either by the First Utility District of Hawkins County or private wells and septic systems (First Utility District of Hawkins County 2022). A treated water supply line from Rogersville extends down the right abutment and crosses the Holston River upstream of the dam. However, the water line is scheduled to be abandoned in the near future as part of a separate water line project at the JCC Plant. The JSF Dam is considered an obstacle by the USEPA (TVA 2015), as its presence reduces the potential for mercury impacted sediments resulting from historical operations at the upstream Olin Corporation Superfund Site migrating downstream into the Holston River. Therefore, the presence of the JSF Dam results in a beneficial effect to the local water supply.

The JSF Dam is located in a rural-residential area in Hawkins County, Tennessee. In addition to various mobile providers, telecommunication services in the Project Area vicinity are provided by Premier Communications Technologies, Charter Communications, Russell Cellular, AT&T, and Cricket Wireless (Rogersville/Hawkins County Chamber of Commerce 2022).

Electrical service is provided by Holston Electric Cooperative, which distributes power provided by TVA (Holston Electric Cooperative 2022; Rogersville/Hawkins County Chamber of Commerce 2022). Nineteen transmission line rights-of-way (ROWs) extend from the JCC Plant, located 0.3 miles south of the dam, but none cross the proposed construction zone or the support/laydown area (USEIA 2022; Figure 1.1-1). Natural gas service is provided by Hawkins County Gas Utility District (Rogersville/Hawkins County Chamber of Commerce 2022).

### 3.20.2 Environmental Consequences

#### 3.20.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Potential effects to utilities would be avoided and minimized by identifying and coordinating with utilities early prior to construction to avoid service disruptions.

No impacts are anticipated with the periodic maintenance activities proposed under Alternative A. However, without modifications to the dam as proposed under Alternatives B and C, there would be an increased risk of the downstream migration of mercury laden sediments and an increased risk for dam failure, resulting in a large adverse effect to water supply. Failure of the JSF Dam would result in dewatering at the JCC water intake, located on the upstream side of the dam on Cherokee Lake, and would force a shut-down at the JCC Plant as the plant cannot operate in combined cycle mode without cooling water from the intake.

#### 3.20.2.2 Alternative B

Alternative B involves riprap armoring on the right embankment to act as a rockfill spillway. Drilling operations require pulling water; however, this would be obtained from the Holston River rather than the First Utility District of Hawkins County. Utility effects would be minimized by identifying and coordinating with utilities early prior to construction to avoid service disruptions. No effects to existing utilities or water supply are anticipated as disruptions would be avoided through early communication regarding the Project and calling “Tennessee 811” to confirm utilities prior to starting work. Long-term beneficial impacts would occur to the water supply due to the decreased risk of mercury laden sediments migrating downstream in the Cherokee Reservoir. No cumulative effects are anticipated.

#### 3.20.2.3 Alternative C

Alternative C involves the construction of a RCC gravity dam. Impacts to utilities are the same as those described under Alternative B. No effects existing utilities or water supply are anticipated disruptions would be avoided through early communication regarding the Project and calling “Tennessee 811” to confirm utilities prior to starting work. Long-term beneficial impacts would occur to the water supply due to the decreased risk of mercury laden sediments migrating downstream in the Cherokee Reservoir. No cumulative effects are anticipated.

## 3.21 Environmental Justice and Socioeconomics

Social, economic, and sociocultural characteristics of potentially affected populations, as well as Environmental Justice (EJ) populations, including minority and low-income populations, are assessed in this section using the U.S. Census Bureau (USCB) 2010 decennial census (2010 Census), USCB 2020 decennial census (2020 Census), and the

2016 to 2020 American Community Survey (ACS) 5-year estimates (2020 ACS), depending on availability of data (USCB 2022a, 2022b, 2022c). The JSF Dam Project EJ Study Area (hereafter "EJ Study Area") includes the Project Area and block groups within a 4-mile radius of the JSF Dam, as illustrated in Figure 3.21-1 and Figure 3.21-2. State and County-level USCB data are included for comparison purposes. Decennial census and ACS data were obtained utilizing USCB Explore Census Data (USCB 2022a). Where appropriate, additional data from USCB and other federal and state agencies are employed, as cited herein.

Where populations were considered EJ populations, additional USCB data, USEPA data, historical information, and relevant details from other sources were obtained to better understand the socioeconomic and sociocultural aspects of these populations and more effectively evaluate for potential disproportionate environmental and human health effects on EJ populations. The additional USCB data presented includes other relevant demographic factors, as well as information regarding the rural or urban status of the area. USCB criteria define an urbanized area as having a population of 50,000 or more and an urban cluster as having a population between 2,500 and less than 50,000; all areas outside of urbanized areas and urban clusters are considered rural.

The CEQ guidance for applying EO 12898 under NEPA directs identification of minority populations when the total minority population of the affected area exceeds 50 percent, or the minority population percentage of the study area is meaningfully greater than the minority population percentage in the general population or through another appropriate unit of geographic analysis (CEQ 1997). For purposes of this analysis, meaningfully greater minority percentages were defined as those that were 10 percentage points above the minority percentage of the associated county. CEQ defines minority populations as people who identify themselves as Asian or Pacific Islander, American Indian or Alaskan Native, Black (not of Hispanic origin), or Hispanic. Those indicating two or more races are also considered minorities due to necessarily including one of these minorities. Tribal populations were identified using the USHUD Tribal Directory Assessment Tool (TDAT) and the US Department of the Interior (USDOI) Tribal Affairs mapping.

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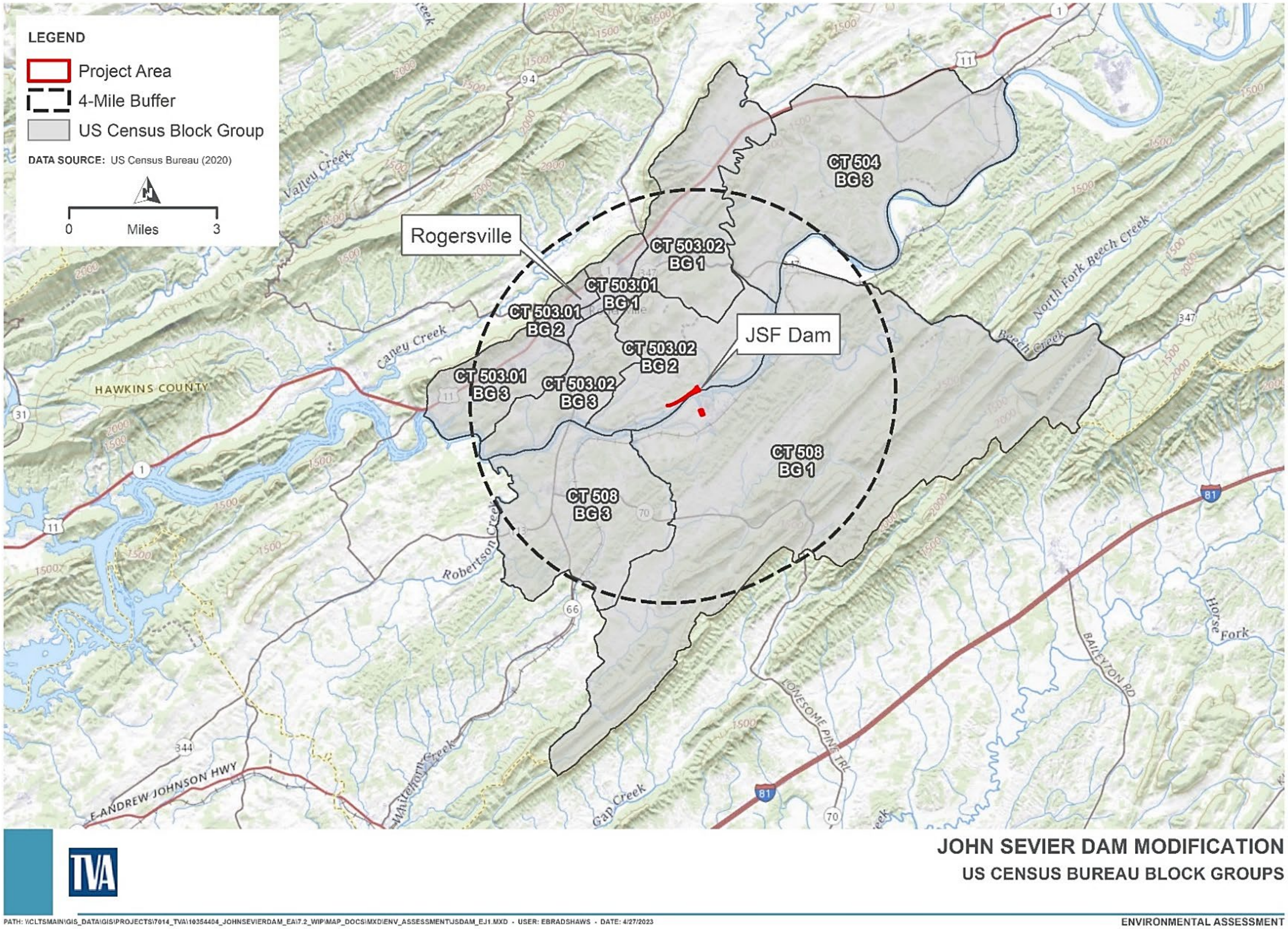


**Figure 3.21-1. EJ Study Area Census Tracks and Block Groups for the Project**

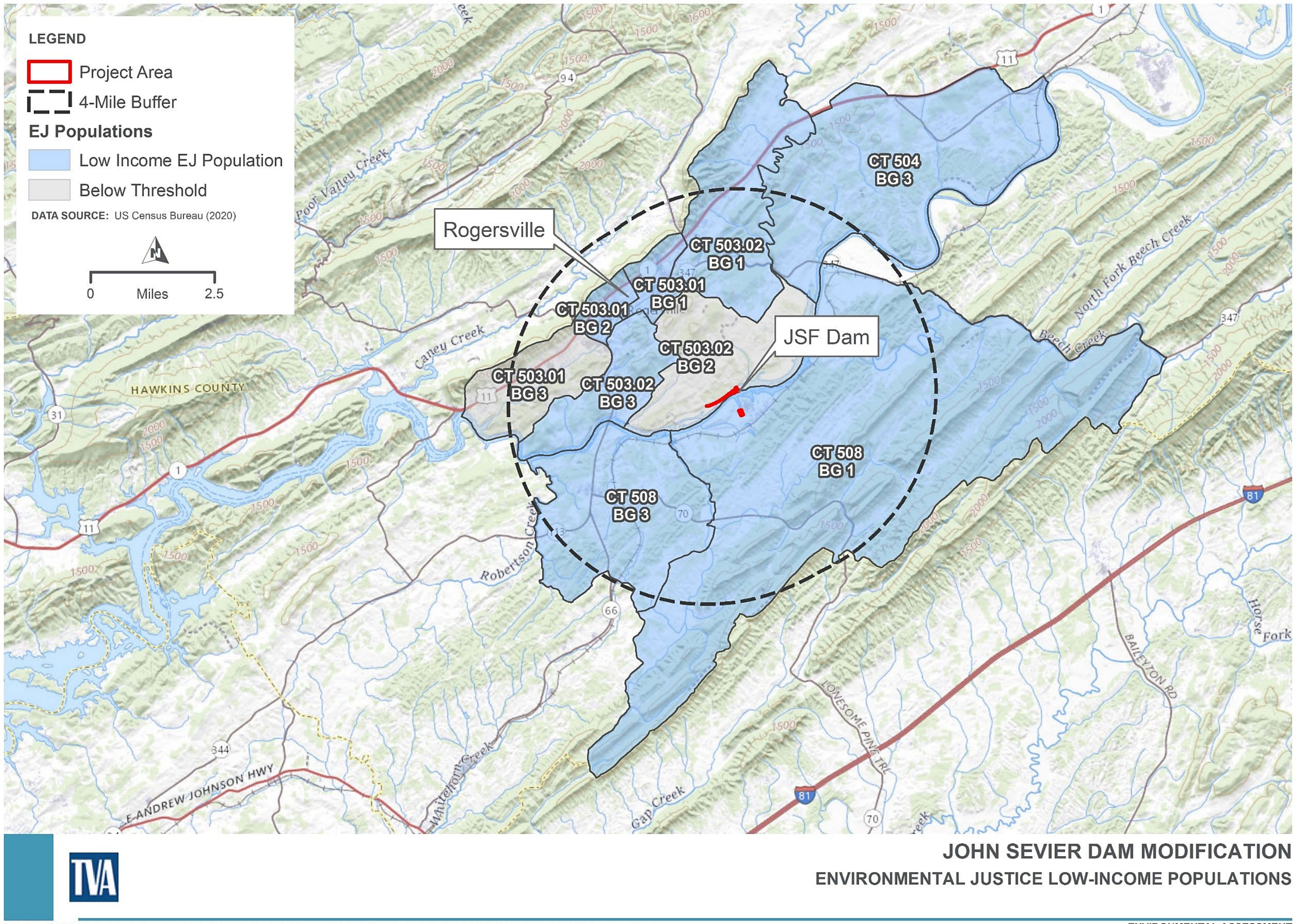


**Figure 3.21-2. JSF Dam Project EJ Study Area Low-Income Block Groups**

The 1997 CEQ guidance specifies that low-income populations be identified using the annual statistical poverty threshold from the USCB Current Population Reports Series P-60 on Income and Poverty. The current (2021) USCB-provided poverty threshold for individuals under age 65 is $14,097, and the official poverty rate for the US as a whole is currently 11.6 percent (USCB 2022b). Low-income populations may also be identified by comparing study area income and poverty rates with the county and/or state data using current USCB Small Area Income and Poverty Estimates (SAIPE) (USCB 2022c). For purposes of this analysis, low-income populations were defined as areas where poverty rates are less than two times the poverty level (i.e., those with poverty ratios defined in the 2020 ACS as 1.99 or lower) and those rates exceed the associated county's rate, calculated in the same manner. While this criterion is more encompassing than the use of base poverty levels from the USCB Current Population Reports Series P-60 or the USCB SAIPE, this low-income threshold, also used by USEPA in their delineation of low-income populations, is an appropriate measure for EJ consideration because current poverty thresholds are often too low to adequately capture the populations adversely affected by low-income levels, especially in high-cost areas (USEPA 2019). According to USEPA, the effects of income on baseline health and other aspects of susceptibility are not limited to those below the poverty thresholds. For example, populations having an income level from one to two times the poverty level also have worse health overall than those with higher incomes (U.S. Centers for Disease Control and Prevention 2011).

The socioeconomic and EJ Study Area was defined as the census block groups that are within a 4-mile radius of the dam location (see Figure 3.21-2). This area was selected to (1) understand the larger demographic context, including non-EJ areas, and to allow for analyses of potential disproportionate effects on EJ populations with attention to their different characteristics and geographic locations, (2) evaluate socioeconomic and EJ effects based on the full geographic extent of project effects on other resource areas (such as air quality, transportation, water resources, etc.), and (3) analyze cumulative effects on socioeconomics and EJ populations. The census block groups within the EJ Study Area are given in tables as census tract (CT) number and block group number (e.g., CT 503.01 BG 1) based on 2020 census geographies. Within the 4-mile radius, three census block groups are not included in the analysis to avoid skewing results. These three block groups overlap only very small portions of the 4-mile radius boundary and/or have limited to no households within the boundary.

## 3.21.1 Affected Environment

### 3.21.1.1 Environmental Justice

#### 3.21.1.1.1 Minority Populations

No census block groups within the EJ Study Area were identified as qualifying minority EJ populations (see Table 3.21-1). At the county level, a greater proportion of the populations of Hawkins County, Tennessee, where the JSF Reservation is located, self-identified as non-minority than across Tennessee, based on the 2020 Census. Correspondingly, the minority populations in the County were generally smaller proportionally than statewide.

Based on the 2020 Census, the two census block groups encompassing the JSF Reservation and Dam demonstrated a lower proportion of persons identifying as minorities than across the state. One census block group, CT 503.02 BG 2, had a higher proportion of people who self-identified as minorities than across the County, and the other census block group (CT 508 BG 1) was lower than the County. While the overall EJ Study Area had a lower minority percentage than the state, five of the nine census block groups within the EJ

Study Area had higher percentages of minorities in comparison with Hawkins County. However, no census block groups in the study area had minority percentages that are 10 percentage points or more above the County average of 6.3 percent.

**Table 3.21-1. Minority Percentage and Ethnicities in the JSF Dam Project EJ Study Area**

| Geography | % Minority | % White[1] | % Black/ African Am. | % Am. Indian/ AK Native | % Asian | % Native Hawaiian /Pacific Islander | % Some Other Race | Two or More Races | % Hispanic /Latino[2] |
|---|---|---|---|---|---|---|---|---|---|
| *Tennessee* | *27.8* | *72.2* | *15.8* | *0.4* | *2* | *0.1* | *3.6* | *6* | *6.9* |
| *Hawkins County* | *6.3* | *93.7* | *1.2* | *0.2* | *0.5* | *0* | *0.7* | *3.7* | *1.6* |
| CT 503.01 BG 1 | 9.2 | 90.8 | 3.7 | 0.3 | 0.7 | 0 | 0.7 | 3.8 | 2.4 |
| CT 503.01 BG 2 | 9.5 | 90.5 | 3.5 | 0.1 | 0.5 | 0 | 0.9 | 4.6 | 2.3 |
| CT 503.01 BG 3 | 5.7 | 94.3 | 1.6 | 0.2 | 0.6 | 0 | 0.5 | 2.7 | 1.1 |
| CT 503.02 BG 1 | 10.7 | 89.3 | 2.8 | 0.2 | 1.1 | 0 | 2.6 | 4.1 | 3.2 |
| CT 503.02 BG 2 (JSF) | 7.6 | 92.4 | 2 | 0.1 | 0.3 | 0 | 0.8 | 4.5 | 2.1 |
| CT 503.02 BG 3 | 9.7 | 90.3 | 2.6 | 0.2 | 1.5 | 0 | 0.6 | 4.7 | 0.6 |
| CT 504 BG 3 | 4.9 | 95.1 | 0.3 | 0.3 | 0.2 | 0.1 | 0.3 | 3.7 | 1.1 |
| CT 508 BG 1 (JSF) | 5.5 | 94.5 | 0.2 | 0.1 | 0.2 | 0 | 1 | 4 | 1.3 |
| CT 508 BG 3 | 6.3 | 93.7 | 1 | 0.2 | 0.6 | 0 | 1 | 3.4 | 1.5 |

Source: 2020 Census (USCB 2022a, 2022b, 2022c)
[1] Race percentages are provided for those reporting a particular race alone or in combination.
[2] This group is calculated separately from the other ethnicities and may include overlap from the other categories, as the USCB does not consider Hispanic or Latino a "race."
Note: No census block groups are classified as minority populations.

### 3.21.1.1.2 Low-Income Populations

The census block groups emboldened in Table 3.21-2 represent areas with qualifying low-income EJ populations. Based on the 2021 SAIPE, a higher proportion of the population of Hawkins County was living in poverty when compared with the whole state (USCB 2022c).

At the census block group level, based on the 2020 ACS, seven of the nine census block groups within the EJ Study Area had higher percentages of people living in poverty than Hawkins County (USCB 2022b). These census block groups, emboldened in Table 3.21-2, are defined as the areas where the chance for disproportionate environmental and human health effects may be the greatest.

**Table 3.21-2. Poverty rates for the JSF Dam EJ Study Area**

| | **2021 SAIPE** | **2020 ACS** | |
|---|---|---|---|
| Geography | Poverty % | Poverty %, Households | Poverty Ratio, Two Times US Threshold * |
| Tennessee | 13.7 | 14.4 | 33.8 |
| Hawkins County | 16.5 | 16.9 | 40.8 |

| | 2021 SAIPE | 2020 ACS |
|---|---|---|
| CT 503.01 BG 1 | 29.4 | 45.5 |
| CT 503.01 BG 2 | 20.0 | 45.2 |
| CT 503.01 BG 3 | 0.0 | 24.5 |
| CT 503.02 BG 1 | 13.9 | 46.5 |
| CT 503.02 BG 2 (JSF) | 22.4 | 35.7 |
| CT 503.02 BG 3 | 24.0 | 62.2 |
| CT 504 BG 3 | 34.4 | 63.2 |
| CT 508 BG 1 (JSF) | 19.3 | 48.2 |
| CT 508 BG 3 | 11.6 | 44.6 |

*Calculated based on percent of population with a ratio of income to poverty threshold ≤1.99
Source: 2020 ACS (USCB 2022a, 2022b, 2022c)
Note: Emboldened census block groups represent identified EJ populations as compared with the county percentage.

#### 3.21.1.1.3 Tribal Populations

According to the HUD TDAT and the USDOI Tribal Affairs mapping, no Federally Recognized Tribes are known to exist within the study area or nearby vicinity, and no State Recognized Tribal or Urban Communities are known to exist within Hawkins County. TVA has established formal consultation with over 20 federally recognized Indian tribes. The following federally recognized Indian tribes have informed TVA that Hawkins County, Tennessee is in their area of interest: Absentee Shawnee Tribe of Indians of Oklahoma, Cherokee Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Kialegee Tribal Town, The Muscogee (Creek) Nation, Shawnee Tribe, Thlopthlocco Tribal Town, and the United Keetoowah Band of Cherokee Indians in Oklahoma. No tribal populations (including reservation or allotment lands) are present in Hawkins County.

#### 3.21.1.1.4 Qualifying EJ Populations

Qualifying EJ populations and individual areas with EJ indicators are generally prominent in the EJ Study Area, with only two of the nine census block groups not encompassing qualifying EJ populations. The two block groups that do not include qualifying EJ populations overlap the western portion of Rogersville (CT 503.01 BG 3) and the northern half of the JSF Reservation (CT 503.02 BG 2). The southern portion of the JSF Reservation is overlapped by CT 508 BG 1, which is an identified qualifying EJ population. In this section, additional data for the EJ-qualifying census block groups, consisting of seven low-income census block groups, are provided in Table 3.21-2 along with comparison data for the state and respective county. The seven census block groups with qualifying EJ populations are listed below.

- CT 503.01 BG 1
- CT 503.01 BG 2
- CT 503.02 BG 1
- CT 503.02 BG 3
- CT 504 BG 3
- CT 508 BG 1 (includes construction office and materials storage footprint on the southern half of the John Sevier Reservation)

- CT 508 BG 3

Hawkins County is largely rural. While the John Sevier Reservation is located within the Kingsport-Bristol-Bristol, Tennessee-Virginia Metropolitan Statistical Area, Rogersville is the only area within Hawkins County that is within an urban cluster based on USCB criteria (USCB 2020a). Portions of Rogersville include some of the EJ-qualifying census block groups. The John Sevier Reservation is located outside of the Rogersville urban cluster.

#### 3.21.1.2 Socioeconomics

Additional data on area socioeconomics and EJ populations is shown in Table 3.21-3. Qualifying EJ populations are listed first followed by the two other census block groups (i.e., non-qualifying EJ populations) included in the study area.

Population data for Tennessee, Hawkins County and study area census block groups are provided in Table 3.21-3, based on the 2010 Census, 2020 Census, and 2019 ACS. As shown, from 2010 to 2020, Hawkins County and four of the Census block groups experienced population declines, and while other block groups' populations increased, none increased at the rate of the state. Only CT 503.01 BG 1 approached the growth rate of the state, at 8.4 compared to 8.9, respectively.

Table 3.21-3 provides several additional datasets for the state, county, and study area block groups including minority and poverty ratio data. Hawkins County's minority percentage is 6.3 percent. Minority percentages for all block groups range from a low of 5.5 percent to a high of 10.7 percent, demonstrating that the study area does not vary significantly from the County as a whole in regard to minority populations. Poverty ratios for CT 503.01 BG 3 and CT 503.02 BG 2 are markedly lower than those of the seven EJ-qualifying block groups and the County, however. Other indicators, including percent high school or higher, percent unemployment, and per capita income, are generally more favorable for these same two, non-qualifying EJ block groups, as well.

Other datasets presented in Table 3.21-3 show that Hawkins County has several indicators demonstrating a disparity with the state. Specifically, Hawkins County as compared to the state demonstrates a higher poverty ratio; a higher percentage of the population 65 years or over; a smaller percentage completing high school or higher; a lower percentage of the population in the labor force; a higher unemployment rate, and lower per capita income.

The datasets presented in Table 3.21-3 show that the census block groups are generally consistent with the County and, in many cases, with each other. Some notable exceptions occur, however. For instance, two block groups (CT 503.02 BG 3 and CT 504 BG 3) have poverty ratios in the 60s compared to the County at 40.8 percent. CT 503.02 BG 1 also differs considerably from the County in its population 65 and over and its median age, at 44.8 and 61.4, respectively. These numbers compare to the County at 20.9 for population 65 and over and 45.2 for median age. Further, CT 503.01 BG 2 stands out for its comparably high renter rate (75.0 percent) and its high unemployment rate (21.4 percent). CT 503.02 BG 3 and CT 504 BG 3 also stand out for their low per capita income amount at $15,152 and $16,136, respectively, as compared to Hawkins County at $25,438. Finally, CT 503.01 BG 3 and CT 503.02 BG 2 demonstrate high percentages of high school or higher completion with both at more than 90 percent.

**Table 3.21-3. Socioeconomics Data for the EJ Study Area (including EJ-qualifying Census Block Groups)**

| Geography | % Minority | Population (2020) | % Change Population 2010 to 2020 Census | % of Population 65 Years and Over | Median Age | % High School or Higher * | % of Occupied Housing Units, Renter Occupied | Median Year Housing Units Built | % of 16+ Civilian Population in Labor Force | Unemploy-ment Rate | Poverty Ratio, Two Times US Threshold | Per Capita Income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tennessee | 27.8 | 6,651,089 | 8.9 | 16.4 | 38.8 | 88.2 | 33.5 | 1984 | 61.1 | 5.3 | 33.8 | $30,869 |
| Hawkins County | 6.3 | 56,402 | -0.2 | 20.9 | 45.2 | 86.8 | 23.5 | 1984 | 50.8 | 7.6 | 40.8 | $25,438 |
| EJ-Qualifying CT BGs: | | | | | | | | | | | | |
| CT 503.01 BG 1 | 9.2 | 1,463 | 8.4 | 18.7 | 41.6 | 77.9 | 41.9 | 1955 | 40.1 | 7.6 | 45.5 | $20,150 |
| CT 503.01 BG 2 | 9.5 | 1,363 | -0.6 | 14.1 | 30.6 | 86.1 | 75 | 1953 | 56.7 | 21.4 | 45.2 | $21,183 |
| CT 503.02 BG 1 | 10.7 | 1,253 | 5.3 | 44.8 | 61.4 | 89.7 | 28.4 | 1981 | 34.6 | 0 | 46.5 | $34,359 |
| CT 503.02 BG 3 | 9.7 | 1,076 | 5.3 | 24.3 | 39.2 | 66.9 | 45.7 | 1978 | 51.9 | 7.5 | 62.2 | $15,152 |
| CT 504 BG 3 | 4.9 | 1,782 | 3 | 16.7 | 43.3 | 77.9 | 35.4 | 1985 | 45.1 | 2.8 | 63.2 | $16,136 |
| CT 508 BG 1 (JSF) | 5.5 | 1,265 | -3.4 | 31.4 | 56.4 | 81.5 | 24.7 | 1985 | 37.7 | 14.6 | 48.2 | $18,126 |
| CT 508 BG 3 | 6.3 | 1,346 | -7 | 24.1 | 41.6 | 89.2 | 11 | 1977 | 51.8 | 3.5 | 44.6 | $20,413 |
| Non-EJ-Qualifying CT BGs: | | | | | | | | | | | | |
| CT 503.01 BG 3 | 5.7 | 1,917 | 0.7 | 27.1 | 46.8 | 90.4 | 16.3 | 1975 | 57 | 3.9 | 24.5 | $27,703 |
| CT 503.02 BG 2 (JSF) | 7.6 | 1,446 | -6.2 | 13.6 | 39.4 | 95.9 | 24.4 | 1994 | 47.8 | 3.2 | 35.7 | $22,450 |

Sources: 2010 Census; 2020 Census; 2019 ACS (USCB 2022a, 2022b, 2022c)

### 3.21.2 Environmental Consequences

#### 3.21.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would potentially result in minor, short-term beneficial impacts on socioeconomics and EJ communities, primarily through the temporary employment of workers to conduct maintenance activities on the JSF Dam. Additionally, there would potentially be minor, temporary impacts to EJ communities due to increased traffic on area roadways resulting in increased noise and air quality on roads.

The possibility of dam failure may impact noise and air quality within the Project Area due to increased vehicles on-site if cleanup/mitigation efforts are required. As there are no EJ populations directly within the Project Area, disproportionate impacts as a result of these resource areas are unlikely to occur.

Internal erosion alone or that leads to a dam failure could affect groundwater near the JSF Dam. Dam failure could have a large and long-term adverse effect to groundwater near the JSF Dam, nearby recreational and natural areas, and surface waters downstream resulting from the downstream migration of mercury laden sediments currently located upstream of the JSF Dam, where they could contaminate groundwater sources through established karst features. This could impact socioeconomic resources or EJ communities located downstream of the John Sevier Dam. Depending on the magnitude of dam failure and extent of downstream impacts from mercury laden sediments, cumulative effects could occur.

#### 3.21.2.2 Alternative B

Implementation of Alternative B would result in minor, short-term beneficial impacts on socioeconomics, primarily through the temporary employment of about 30 workers to conduct modifications to the JSF Dam. If these workers are local to the area, beneficial impacts would include short-term, minor increases in employment. If the workers come from beyond commuting distance, beneficial impacts could include increased spending at local temporary housing facilities and restaurants, and short-term minor increases in lodging and sales taxes. Indirect beneficial impacts would be minor and would include spending by workers in the local economy. These temporary beneficial impacts could extend to EJ populations if workers among EJ populations are hired or if patronage of businesses owned by members of EJ populations increase.

Traffic increases on SR 70 (TN-70) and Trail of the Lonesome Pine may result in minor, temporary impacts to noise and air quality on these roads. EJ populations along the northern and southern sections of TN-70 within CT 503.02 BG 3, and CT 508 BG 3 respectively could experience minor, temporary impacts. Additionally, Trail of the Lonesome Pine within CT 508 BG 1 which connects TN-70 to the JSF Dam could experience minor, temporary impacts. These three block groups are EJ-qualifying communities and therefore may experience minor, temporary disproportionate impacts as a result of project activities. Increased fugitive dust would be primarily limited to the construction area.

As described in Section 3.14.2, during construction, Alternative B would increase noise levels at the nearest residences along McKinney Chapel Road to a level of approximately 60 dBA or less. These residences sit within CT 503.02 BG 2 which is not an identified EJ population. Cumulative effects to EJ communities are not expected.

#### 3.21.2.3 Alternative C

Implementation of Alternative C would employ about 30 people for 7 to 8 months, the same length of time as Alternative B. Thus, the same effects on socioeconomics and EJ populations are anticipated to result due to Alternative C as Alternative B, consisting of increases in traffic and related noise and air emissions, fugitive dust, and noise levels to approximately 60 dBA or less. Cumulative effects to EJ communities are not expected.

## 3.22 Safety

This section provides an overview of existing public and occupational (worker) health and safety regarding the JSF Dam and the potential impacts on public health and safety associated with the proposed Alternatives. Public health and safety topics include emergency response and preparedness to ensure that project construction and operation do not pose a threat to public health and safety. Occupational health and safety issues include worker safety in compliance with OSHA standards.

A variety of federal safety regulations and requirements apply to all TVA facilities, lands, and projects. These include the following:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 U.S.C., 9601 et seq.);
- Superfund Amendments and Reauthorization Act Public Law 99-499 (100 Stats. 1613);
- Resource Conservation and Recovery Act (42 USC, 6901 et seq.);
- Clean Water Act (33 USC, 1251 et seq.), which includes requirements for Spill Prevention Control and Countermeasures Plans;
- Hazardous Material Transportation Act (49 USC 59 et seq.);
- Toxic Substances Control Act (15 USC, 2601 et seq.);
- Federal Regulations on Hazardous Waste Management (40 CFR, Parts 260-279);
- Chemical Accident Prevention Provisions (40 CFR, Part 68);
- Emergency Planning and Community Right-to-Know Act of 1986 (42 USC, 16 et seq.); and OSHA standards (Occupational Safety and Health Act of 1970) (29 CFR).

### 3.22.1 Affected Environment

Public emergency services in the area include various medical centers, law enforcement services, and fire protection services. Health care institutions include the Hawkins County Memorial Hospital and urgent care center Walk-in Medical Clinic located in Rogersville, Tennessee approximately 3 miles northwest of the JSF Dam. Law enforcement services within the vicinity of JSF Dam include the Hawkins County Sheriff's Office and Rogersville Police Department located in Rogersville, Tennessee.

Fire departments within the vicinity of the JSF Dam include the Striggersville Volunteer Fire Department approximately two miles north on McKinney Chapel Road and the Hawkins County Rescue Squad, Rogersville Fire Department, and Persia Fire Departments all within five miles of the dam. Additionally, the Tennessee Emergency Management Agency is available for assistance by reaching out for mutual aid from local jurisdictions, Tennessee agencies and departments, and the federal government for assistance in the event of disasters and emergencies.

TVA maintains personnel at the JCC Plant to provide security support. TVA also patrols general boater safety and behavior near the dam. To date, no safety features or drawdowns have been implemented in relation to safety concerns.

## 3.22.2 Environmental Consequences

### 3.22.2.1 Alternative A

As described in Section 2.1.1, TVA would perform periodic maintenance of the JSF Dam to maintain the current configuration of the right embankment. Maintenance activities would potentially result in temporary safety risks associated with worker exposure to hazards associated with most large construction projects including falls, heavy equipment accidents, and trenching accidents. Additionally, maintenance activities could result in potential public and occupational health and safety hazards could result from increased traffic flow along the public roadways.

Maintenance alone would not address the risks identified in the 2019 JSF Dam risk assessment. Without modifications the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows.

Internal erosion alone or that leads to a dam failure would have negative impacts to soils beneath the existing right embankment and depending on the extent of leakage and erosion to the dam embankment, could affect surface waters downstream of the JSF Dam. Further, Alternative A would result in an increased risk for moderate adverse environmental consequences associated with dam failure from overtopping erosion.

The entire reach of the Holston River upstream of the JSF Dam (all fish species) and the Cherokee Reservoir downstream of the dam (black bass and catfish) are currently listed under a TDEC Fish Consumption Advisory, which includes recommended limits on quantity and frequency of fish that can safely be consumed by vulnerable populations based on potential for mercury contamination (TWRA 2020). Dam failure would result in deposition of mercury laden sediment downstream in the Cherokee Reservoir and could likely result in the Cherokee Reservoir fish advisory being extended to all fish species. Depending on extent of downstream reach of the dam failure, cumulative effects may occur and could include an extension of the fish advisory further downstream.

Dam failure could have a large impact on safety within the Project Area. If maintained, the dam is anticipated to remain generally in its current condition and no additional occupational health and safety impacts on the workers would be associated with the proposed maintenance activities.

If the dam is maintained rather than improved, all safety risks associated with current conditions above would remain, and therefore, the purpose and need of the project to address these concerns would not be met.

### 3.22.2.2 Alternatives B and C

Construction activities associated with both Alternatives B and C would expose workers to hazards associated with most large construction projects including falls, heavy equipment accidents, and trenching accidents. Additionally, due to the proximity of the proposed construction areas to the reservoir, there is the possibility that falling into the water could lead to injury or death. Environmental hazards of construction projects include working in extreme temperatures (primarily heat stress) and potential exposures to biological hazards such as mosquitoes, ticks, poisonous spiders, and venomous snakes.

TVA would require the construction contractors to emphasize safety, to follow all OSHA and other federal and state regulations with respect to worker safety, and to comply with all applicable health and safety procedures. As construction work has known hazards, standard practice is for contractors to establish and maintain health and safety plans in compliance with OSHA regulations. Such health and safety plans emphasize implementation of BMPs for site safety management to minimize risks to workers. Based on the nature of the proposed construction activities and their proximity to water, the risk of potential temporary minor negative impacts related to occupational health and safety are increased but could be mitigated through implementation of a rigorous site health and safety plan.

Current boating restriction areas located at the JSF Dam may be extended slightly farther than normal during construction and would be marked with signs such as buoy markers and barricade floats. Therefore, public safety impacts on the reservoir associated with construction would be minor due to heightened boater awareness.

Potential public and occupational health and safety hazards could result from the flow of construction traffic along the public roadways. The proposed number of trucks is not anticipated to substantially affect traffic in the region; however, the presence of these trucks on the local roadway network throughout the duration of the construction could negatively affect the traveling public and workers operating project-related trucks and vehicles. Similarly, public knowledge of the haul routes and clearly marked signage along the haul routes would increase public awareness of the trucks using the roadway network throughout the duration of the construction activities to help mitigate potential affects.

Overall, implementation of Alternatives B and C would result in minor impacts to public and occupational health and safety.

## 3.23 Cumulative Effects

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

A cumulative effect analysis must consider the potential impact on the environment that may result from the incremental impact of a project when added to other past, present and RFFAs (40 CFR §1508.7). Baseline conditions reflect the impacts of past and present actions. The cumulative effect analyses summarized in preceding sections are based on baseline conditions and, therefore, incorporate the cumulative effects of past and present actions.

### 3.23.1 Identification of Other Actions

Two actions were identified within a 10-mile radius of the JSF Dam as having the potential to, in aggregate, result in larger and potentially adverse impacts to environmental resources in the Project Area. The SR 66 Improvement Project is a proposed widening of SR 66 from a two-lane roadway to a three-lane roadway with a center turn lane or realignment of the two-lane roadway, depending on location, from US 11E to Speedwell Road, approximately six miles southwest of the Project Area (TDOT 2022b). The Phipps Bend Industrial Park is an existing 1,100-acre industrial park approximately 10 miles northeast of the Project Area. There are 11 existing industries on-site that employ a total of approximately 1,500 people. A 12th industry is expected to add 86 new jobs over the next five years. There are 300 acres available for future expansion according to the Tennessee Department of Economic and Community Development (TDECD 2022) and the Hawkins County Industrial Development Board (HCIDB 2022).

### 3.23.2 Analysis of Cumulative Effects

To address cumulative effects, the existing affected environment surrounding the Project Area was considered in conjunction with the environmental impacts presented in Chapter 3. These combined impacts are defined by the CEQ as "cumulative" in 40 CFR Section 1508.7 and may include individually minor, but collectively significant actions taking place over a period of time. The potential for cumulative effects to the identified environmental resources of concern were evaluated by TVA, which determined there are no cumulative effects expected to occur as a result of the proposed modifications to the JSF Dam under Alternatives B or C.

Under Alternative A, the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows. The dam would also be at an increased risk of moderate effects from internal erosion or internal erosion-related failure. As such, in the event of a dam failure, potentially mercury laden sediments located upstream of the dam could migrate downstream of the dam resulting in effects to one or more resources evaluated in this document. Depending upon the nature of dam failure, land use, soils, geology and groundwater, surface water and water quality, floodplains, wetlands, vegetation and wildlife communities, aquatic ecology, threatened and endangered species and natural areas may be adversely affected by the potential release of contaminated (mercury laden) and noncontaminated sediments, damage from falling trees, and washing away of existing vegetation and available habitats. In addition, dam failure and the potential migration downstream of mercury laden sediments may adversely affect natural and recreation areas, solid and hazardous waste, navigation, EJ and socioeconomics, and public safety. When the potential adverse effects of a dam failure under Alternative A (No Action Alternative) are considered along with likely effects from the other actions identified in Section 3.23.1, the selection of Alternative A would result in the potential for cumulative effects.

## 3.24 Unavoidable Adverse Environmental Impacts

While the No Action Alternative has no immediate unavoidable adverse environmental impacts (because this alternative does not involve construction activities), the dam would be vulnerable to failure under the No Action Alternative. Adverse environmental impacts from the No Action Alternative, such as moderate to large impacts to land use, soils, geology and groundwater, surface waters and water quality, floodplains, wetlands, vegetation communities, wildlife, aquatic ecology, threatened and endangered species, natural and recreation areas, solids and hazardous waste, navigation, EJ communities, and public safety could occur if the dam failed because of not improving it. A partial or full dam failure would potentially result in the downstream migration of mercury laden sediments currently located upstream of the dam which could be avoided through the proposed Action Alternatives (Alternatives B and C).

Alternatives B and C could cause minor unavoidable adverse environmental impacts. Construction activities associated with both Action Alternatives would generate similar fugitive air and dust emissions immediately within the Project Area as well as increased noise levels and traffic levels on nearby roads. However, TVA would implement the appropriate control methods and mitigation measures, as discussed in Section 2.3, to minimize these effects resulting in only minor impacts.

Construction of either Alternative B or C would also result in the permanent loss of vegetated areas (herbaceous and forested areas) and surface waters of the Cherokee Reservoir that provide suitable habitat for wildlife and aquatic species and provide other ecosystem values and functions. However, permanent impacts occur mostly within previously disturbed area associated with the existing JSF Dam and access road. In addition, forested areas would be cleared during winter months to avoid direct impacts to federally listed bat species and most nesting migratory birds; disturbed areas would be stabilized with permanent vegetation; and sediment and erosion controls would be employed during construction to minimize adverse effects from soil and rock excavation and construction of the final structure footprints. As such, unavoidable adverse effects from Alternatives B and C to vegetated areas, surface waters, wildlife, and aquatic ecology would be minor.

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

NEPA requires consideration of the “relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR §1502.16). For implementation of Alternatives B and C, short-term uses generally are those that are expected to occur within the construction period, while long-term uses refer to the post-construction period lasting for several decades.

Implementation of the action alternatives would have various short- and long-term consequences. Short-term (construction related) impacts caused by the project would be similar for either Alternative B or C. Adversely affected resources include land use, soils, geology and groundwater, surface waters, floodplains, vegetation, wildlife, aquatic ecology, threatened and endangered species, air quality, climate, noise and vibration, transportation, navigation, visual resources, and utilities. However, most of these impacts would be minor and temporary, lasting only the duration of the construction activities. Short-term beneficial impacts to socioeconomics and EJ are anticipated.

However, the long-term impacts that would occur over the life of the completed dam modifications would result in overall beneficial effects with regard to human health and the environment for either Alternative B or C. Either project action alternative would address the purpose and need of the project. Not taking action (Alternative A) would continue to place human safety and the environment at risk from impacts of a potential dam failure of the right embankment over the long-term.

## 3.26 Irreversible and Irretrievable Commitments of Resources

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

The proposed JSF Dam Modifications, under either Alternative B or Alternative C, would result in an irreversible and irretrievable commitment of resources as the existing JSF Dam would be permanently modified as described in Sections 2.1.2 and 2.1.3. As such, the impacts associated with the Action Alternatives would result in irreversible and irretrievable commitment of resources. Once site clearing and construction activity is initiated, any permanent impacts to specific resources could not be reversed. Once construction is initiated, the dam structure and its final footprint would be permanently modified and could not be easily reversed.

The No Action Alternative would not result in an irretrievable or irreversible commitment of resources but would require continued monitoring and maintenance activities, as needed, to reduce the risk of erosion of the embankment which could lead to a dam failure.

# CHAPTER 4 – LIST OF PREPARERS

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Project Role: Biological Resources
Experience: 14 years in fisheries, biological sciences, USACE and FERC documentation

**Karen Burchardt**
Education: M.S. Environmental Engineering; B.S. Civil Engineering
Project Role: Air Quality and Greenhouse Gas Emissions
Experience: 23 years

**Alex Lefitz**
Education: B.S. Geology
Project Role: Solids and Hazardous Waste, Geology and Groundwater
Experience: 7 years

**Sarah Weyler**
Education: B.S., Environmental Science: Policy & Planning
Project Role: Public & Occupational Health and Safety, Natural Areas, Parks and Recreation
Experience: 1 year in NEPA preparation

**Ivan Maldonado**
Education: B.S., Natural Resource & Environmental Economics
Project Role: Surface Waters and Wetlands
Experience: 10 years in wetland delineations and environmental permitting

**Rebecca Colvin**
Education: M.S., English; B.S., English
Project Role: Socioeconomics & Environmental Justice
Experience: 26 years

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# CHAPTER 5 – LITERATURE CITED

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# Appendix A – Responses to Public Comments Received on the Draft Environmental Assessment During the Public Comment Period

# APPENDIX A – RESPONSES TO PUBLIC COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE JOHN SEVIER DAM MODIFICATION PROJECT

## Introduction

A draft of this environmental assessment (EA) was released for public comment on May 30, 2023. The Environmental Protection Agency (EPA) Notice of Availability of the Draft EA was posted in the Federal Register on May 30, 2023, and the comment period closed on June 30, 2023. The Draft EA was transmitted to state, federal, and local agencies and federally recognized tribes. It also was posted on TVA's public NEPA review website. Notice of availability of the draft and the request for comments was published in newspapers serving the John Sevier Dam project area. TVA accepted comments through an electronic comment form on the project website, by mail, and by email.

TVA received a total of 13 comments from nine commentors; approximately 27.3 percent of comments received were in support of Action Alternative C (Roller-Compacted Concrete, as described in Section 2.1.3 of the Final EA) and another 27.3 percent were supportive of Alternative A, the No Action Alternative. The remaining comments were a mix of questions, agency comments, or recommendations to TVA, a portion of which were specific to the JSF project. Most of the comments were submitted through the web-based comment form. One comment received was regarding improvements to fish passage and is outside the scope of the draft EA and is not discussed further in this report.

TVA carefully reviewed all of the comments received and has responded to those comments in the following table.

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## Response to Comments

| Comment | TVA Response to Comment | Commentor Name | Commentor Affiliation |
|---|---|---|---|
| Option A is in my opinion the best option. Do nothing. Leave the dam as it is now. The area above the dam has dilated in so much over the years that the best action is to do nothing or possibly dredge some of the silted area above the dam. | Your support for Alternative A, the No Action Alternative, has been noted. | Wayne Puckett | |
| If the dam is in no danger of failure, why would you modify it. People that use it love it as is and people come from all over to fish above the dam. Why would anybody want to change what is working so well unless it was in danger of failing and I see nothing in the notice that indicates that. Thank you | Section 1.2 of the Draft and Final EA describes the purpose and need for the proposed action, which includes addressing the potential risk of failure of the existing dam. | Charles Gibson | |
| Thank you, I feel TVA should choose option A because they have just spent money and time reinforcing this area recently and this would save Rate payers money. More so any other option would be detrimental to the McKinney Chapel Rd by traveling the required amount of trucks on this road while it is already in very poor shape and several areas already falling away from normal traffic. | Your support for Alternative A, the No Action Alternative, has been noted. TVA has updated Section 3.15 of the Final EA document to include additional discussion on potential impacts to McKinney Chapel Road, added documentation of existing road conditions to Appendix C and added commitments to conduct a detailed survey of existing road conditions immediately prior to construction and to monitor for damage associated with project-related truck traffic. | Mike Sodertburg | |
| We are writing this letter in response to the proposed John Sevier Dam Modification. We are homeowners on John Sevier Lake, about 1.2 miles upstream of the dam and have lived here since November, 2004. I fish this lake (catch and release), and we actively bird this area daily. We are members of the Tennessee Ornithological Society, and Susan is a board member. We have reviewed the John Sevier Draft Environmental Assessment document and our comments are as follows.<br><br>Regarding the proposed plan "A":<br>We think that plan A is not acceptable since any future dam failure would cause us to lose access to the lake and expose us to any contamination the lake bottom may contain. We only have 2'-3' of water at our dock and lake bottom has over 12" of muck that we suspect is also contaminated with mercury and whatever Holston Defense may have been releasing all these years. We were shocked that this part of the Holston River is one of the most polluted rivers in the US. A failure would also be detrimental to the wildlife that use John Sevier lake.<br><br>Regarding the proposed plans "B" and "C":<br>We think plan C is the better choice since the area to be disrupted would be smaller and therefore better for the wildlife found in this area. This would have minimal impact on the fishing, birding, and other wildlife upstream of the dam. Regarding wildlife information referred to in John Sevier Dam Modification Draft Environmental Assessment section 3.10: The area upstream of the dam is an important area for wildlife, especially birds. Bald Eagles do nest in the area. The nest referenced in report 0.9 miles from dam failed in February 2022 and we believe it has been rebuilt closer to the dam on the north side of lake. When I surveyed for the nest in March 2023, I did not locate the nest. On June 21, 2023, adult eagles were perched on both sides of the dam. A great blue heronry with about 30 active nests is located about 0.1 mile upstream from the dam on the northside of lake, near the concrete pylon the TVA installed. We have observed 7 active osprey nests in the area of the dam. There used to be nesting Black-crowned Night-Herons in the fishing area of the old coal plant, but we have no recent sightings since that area has been closed to the public for many years.<br><br>We are active birdwatchers and submit eBird checklists each day. These checklists are hidden from public view on eBird due to trespassers on our property. We have observed 234 species of birds in the area which ties us with Paris Landing State Park for seventeenth spot on the TN eBird hotspots chart. This area has become an important migratory stop for all types of birds and having the dam fail would put them in jeopardy. Observations of the following rarities have been photographed and documented on eBird: White-faced Ibis, Anhinga, Black-bellied Whistling Ducks, Whimbrel, Purple Gallinule, Red Phalarope, Tundra Swans, all 3 Scoter species, Sandhill Cranes, Tricolored Heron, and Long-tailed Ducks. Attached please find our eBird life list for John Sevier Lake. In closing, we support TVA going forward with plan "C" and are willing to discuss this further if desired. | Your support for Option #3 (Alternative C) has been noted. Thank you for sharing the additional information on bird sightings documented in the area. | Michael & Susan Hubley | |

| Comment | TVA Response to Comment | Commentor Name | Commentor Affiliation |
|---|---|---|---|
| I am an avid fisherman who frequents John Sevier Dam on a regular basis. I feel that option #3 would be the best for the environment, as well as, be more fisherman friendly there and downstream. My choice would be option # 3 | Your support for Option #3 (Alternative C) has been noted. | Lon David Jackson | |
| John Sevier has been a part of the Rogersville community for many years. The dam itself has been enjoyed by generations of fisherman. I feel that the need to repair the existing dam is something that needs extreme consideration. I assume that over the near 70 years of its existence there has been erosion and the need of modifications for some time. I am no engineer, but I feel the need to repair at whatever cost to affirm the next generations the same use of the dam is something many can agree on. Marine life, and many landowners above the dam rely heavily on the protection that this spillway provides. Fisherman and farmers above the dam need this spillway to protect the very existence of the waterway they have come to rely on. At whatever cost is necessary to protect and promote what we have come to enjoy, I feel is needed for all stakeholders who live near and enjoy the waterways the Holston River provides. With any new construction I would encourage TVA to consider bank fisherman once again and allow access to the North side of the dam for those who would use it. Many at one time were able to enjoy the fishing where the water was released from the fossil plant. Once the Gas plant was put in production fisherman access was cut completely off. To open up a north side access would be enjoyed by many in the Rogersville community. | Your support for Option #3 (Alternative C) and suggestion for opening fishing access from the north side of the dam has been noted. | Matt Price | |
| TDEC* has no specific concerns or comments pertaining to Air Pollution Control in the Draft EA. | Your project input has been received and recorded. We appreciate your review and your time. | Jennifer Tribble | TDEC |
| TDEC agrees with TVA that Alternatives B and C would require an individual Aquatic Resource Alteration Permit (ARAP), a NPDES Construction General Stormwater Permit (CGP) with a Stormwater Pollution Prevention Plan (SWPPP), and a Class V injection permit involving the grouting of karst features beneath the dam. | Your project input has been received and recorded. TVA will apply for and comply with all applicable permits and their stipulations and requirements. We appreciate your review and your time. | Jennifer Tribble | TDEC |
| Based on the information provided, no significant archeological resources will be disturbed by the proposed project. No archaeological sites are recorded in the project area and no further work is recommended. | Your project input has been received and recorded. We appreciate your review and your time. | Jennifer Tribble | TDEC |
| There is a 2017 final ash impoundment closure programmatic EIS for John Sevier with a recommended plan for dealing with ash. https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-documentlibrary/site-content/environment/environmental-stewardship/environmental-reviews/closure-of-coal-combustionresidual-impoundments/final-eis-part-ii-john-sevier-plant.pdf?sfvrsn=752d2da6_0<br><br>Has anything been done to implement the recommended plan for the coal ash? Is there any connection between actions that might have been taken on this plan that would impact the EA draft for dam modification? | The JSF Plant has four CCR management areas: the Bottom Ash Pond, the Dry Fly Ash Stack, the Ash Disposal Area J, and the Highway 70 Borrow Area. Each of the CCR management areas was previously closed in accordance with applicable State or Federal regulations in effect at the time of closure. The Bottom Ash Pond is the only CCR Unit at the JSF Plant that is subject to the CCR Rule. Closure of the Bottom Ash Pond was completed on December 2017 (257-102(h)_notification-of-completion-of-closure_jsf_bottom-ash-pond.pdf (tva.com)). This information had been added to Section 3.5.1 (Floodplains - Affected Environment). | Bill Kornrich | Care NET, regional Sierra Club committee |

| Comment | TVA Response to Comment | Commentor Name | Commentor Affiliation |
|---|---|---|---|
| Regarding the 2017 final ash impoundment closure programmatic EIS for John Sevier at https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-documentlibrary/site-content/environment/environmental-stewardship/environmental-reviews/closure-of-coal-combustionresidual-impoundments/final-eis-part-ii-john-sevier-plant.pdf?sfvrsn=752d2da6_0. There is no mention of coal ash in the EA draft for dam modification. If the possibility of overflow exists on the right embankment, would the same possibility not impact the left embankment and left side of the river bank - and thus the coal ash? | Assuming a hypothetical one-foot rise in 100- and 500-year flood elevations post-construction as a worst-case scenario, 100- and 500-year flood elevations would still be well below the crest elevations of the four CCR management areas for all alternatives. TVA has updated Section 3.5.2 to include this information. | Bill Kornrich | Care NET, regional Sierra Club committee |
| Regarding the 2017 final ash impoundment closure programmatic EIS for John Sevier at https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-documentlibrary/site-content/environment/environmental-stewardship/environmental-reviews/closure-of-coal-combustionresidual-impoundments/final-eis-part-ii-john-sevier-plant.pdf?sfvrsn=752d2da6_0. The EIS mentioned above references 100 year and 500 year flood plains. The current EA draft does not mention the 500 year flood plain. | In Section 3.5.1, TVA has made clarifying revisions regarding the 500-year floodplain. | Bill Kornrich | Care NET, regional Sierra Club committee |
| This comment really doesn't pertain to what is being asked at this time, but is it possible in the future for TVA to look at building some type of fish ladder or something that would let fish continue upstream of John Sevier weir dam that now is no longer needed for cooling purposes. I do agree it creates calmer and more stable water upstream by leaving in place. | Improvements to fish passage are outside the scope of this action; however, TVA has noted your comment. | Gary Byington | |

*TDEC: Tennessee Department of Environment and Conservation

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# Appendix B – Agency Coordination

**Project Review Form - TVA Bat Strategy** *(06/2019)*

*This form should **only** be completed if project includes activities in Tables 2 or 3 (STEP 2 below). This form is not required if project activities are limited to Table 1 (STEP 2) or otherwise determined to have no effect on federally listed bats. If so, include the following statement in your environmental compliance document (e.g., add as a comment in the project CEC): "Project activities limited to Bat Strategy Table 1 or otherwise determined to have no effect on federally listed bats. Bat Strategy Project Review Form NOT required." This form is to assist in determining required conservation measures per TVA's ESA Section 7 programmatic consultation for routine actions and federally listed bats.*[1]

**Project Name:** John Sevier Dam Modifications **Date:** 9/9/2022

**Contact(s):** Bradley Haynes **CEC#:** **Project ID:** 41210

**Project Location (City, County, State):** Hawkins County, TN

**Project Description:**

Alternatives for consideration include the No-Action Alternative (Alternative A), riprap armoring or the right embankment (Alternative B), and construction of a roller-compacted concrete gravity dam (Alternative C). The proposed alternatives are described in detail below.

## SECTION 1: PROJECT INFORMATION - ACTION AND ACTIVITIES

**STEP 1) Select TVA Action. If none are applicable, contact environmental support staff, Environmental Project Lead, or Terrestrial Zoologist to discuss whether form (i.e., application of Bat Programmatic Consultation) is appropriate for project:**

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

**STEP 2) Select all activities from Tables 1, 2, and 3 below that are included in the proposed project.**

| **TABLE 1. Activities with no effect to bats. Conservation measures & completion of bat strategy project review form NOT required.** | | |
|---|---|---|
| ☐ 1. Loans and/or grant awards | ☐ 8. Sale of TVA property | ☐ 19. Site-specific enhancements in streams and reservoirs for aquatic animals |
| ☐ 2. Purchase of property | ☐ 9. Lease of TVA property | ☐ 20. Nesting platforms |
| ☐ 3. Purchase of equipment for industrial facilities | ☐ 10. Deed modification associated with TVA rights or TVA property | ☐ 41. Minor water-based structures (this does not include boat docks, boat slips or piers) |
| ☐ 4. Environmental education | ☐ 11. Abandonment of TVA retained rights | ☐ 42. Internal renovation or internal expansion of an existing facility |
| ☐ 5. Transfer of ROW easement and/or ROW equipment | ☐ 12. Sufferance agreement | ☐ 43. Replacement or removal of TL poles |
| ☐ 6. Property and/or equipment transfer | ☒ 13. Engineering or environmental planning or studies | ☐ 44. Conductor and overhead ground wire installation and replacement |
| ☐ 7. Easement on TVA property | ☐ 14. Harbor limits delineation | ☐ 49. Non-navigable houseboats |

**TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Conservation measures and completion of bat strategy project review form REQUIRED; review of bat records in proximity to project NOT required.**

| | | |
|---|---|---|
| ☒ 18. Erosion control, minor | ☒ 57. Water intake - non-industrial | ☐ 79. Swimming pools/associated equipment |
| ☐ 24. Tree planting | ☐ 58. Wastewater outfalls | ☐ 81. Water intakes – industrial |
| ☒ 30. Dredging and excavation; recessed harbor areas | ☐ 59. Marine fueling facilities | ☐ 84. On-site/off-site public utility relocation or construction or extension |
| ☒ 39. Berm development | ☐ 60. Commercial water-use facilities (e.g., marinas) | ☐ 85. Playground equipment - land-based |
| ☐ 40. Closed loop heat exchangers (heat pumps) | ☐ 61. Septic fields | ☒ 87. Aboveground storage tanks |
| ☐ 45. Stream monitoring equipment - placement and use | ☐ 66. Private, residential docks, piers, boathouses | ☐ 88. Underground storage tanks |
| ☐ 46. Floating boat slips within approved harbor limits | ☒ 67. Siting of temporary office trailers | ☐ 90. Pond closure |
| ☒ 48. Laydown areas | ☐ 68. Financing for speculative building construction | ☐ 93. Standard License |
| ☒ 50. Minor land based structures | ☐ 72. Ferry landings/service operations | ☐ 94. Special Use License |
| ☒ 51. Signage installation | ☐ 74. Recreational vehicle campsites | ☐ 95. Recreation License |
| ☐ 53. Mooring buoys or posts | ☐ 75. Utility lines/light poles | ☐ 96. Land Use Permit |
| ☐ 56. Culverts | ☐ 76. Concrete sidewalks | |

**Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eMap reviewer or Terrestrial Zoologist.**

| | | |
|---|---|---|
| ☐ 15. Windshield and ground surveys for archaeological resources | ☒ 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter | ☐ 69. Renovation of existing structures |
| ☒ 16. Drilling | ☒ 35. Stabilization (major erosion control) | ☐ 70. Lock maintenance/ construction |
| ☒ 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles) | ☒ 36. Grading | ☒ 71. Concrete dam modification |
| ☐ 21. Herbicide use | ☒ 37. Installation of soil improvements | ☐ 73. Boat launching ramps |
| ☒ 22. Grubbing | ☐ 38. Drain installations for ponds | ☐ 77. Construction or expansion of land-based buildings |
| ☐ 23. Prescribed burns | ☒ 47. Conduit installation | ☐ 78. Wastewater treatment plants |
| ☒ 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors | ☐ 52. Floating buildings | ☐ 80. Barge fleeting areas |
| ☐ 26. Maintenance/construction of access control measures | ☒ 54. Maintenance of water control structures (dewatering units, spillways, levees) | ☒ 82. Construction of dam/weirs/ levees |
| ☒ 27. Restoration of sites following human use and abuse | ☐ 55. Solar panels | ☐ 83. Submarine pipeline, directional boring operations |
| ☐ 28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures) | ☒ 62. Blasting | ☐ 86. Landfill construction |
| ☐ 29. Acquisition and use of fill/borrow material | ☐ 63. Foundation installation for transmission support | ☐ 89. Structure demolition |
| ☐ 31. Stream/wetland crossings | ☐ 64. Installation of steel structure, overhead bus, equipment, etc. | ☐ 91. Bridge replacement |
| ☐ 32. Clean-up following storm damage | ☐ 65. Pole and/or tower installation and/or extension | ☐ 92. Return of archaeological remains to former burial sites |
| ☐ 33. Removal of hazardous trees/tree branches | | |

**STEP 3) Project includes one or more activities in Table 3?** ◉ **YES (Go to Step 4)** ○ **NO (Go to Step 13)**

**STEP 4) Answer questions *a* through *e* below (applies to projects with activities from Table 3 ONLY)**

**a)** Will project involve continuous noise (i.e., ≥ 24 hrs) that is greater than 75 decibels measured on the A scale (e.g., loud machinery)?
- ◉ **NO** (NV2 does not apply)
- ○ **YES** (NV2 applies, subject to records review)

**b)** Will project involve entry into/survey of cave?
- ◉ **NO** (HP1/HP2 do not apply)
- ○ **YES** (HP1/HP2 applies, subject to review of bat records)

**c)** If conducting **prescribed burning** (**activity 23**), estimated acreage: [ ] and timeframe(s) below; ☒ **N/A**

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

**d)** Will the project involve vegetation piling/burning?
- ○ **NO** (SSPC4/ SHF7/SHF8 do not apply)
- ○ **YES** (SSPC4/SHF7/SHF8 applies, subject to review of bat records)

**e)** If **tree removal (activity 33 or 34)**, estimated amount: 0.8 ◉ **ac** ○ **trees** ○ **N/A**

| STATE | SWARMING | WINTER | NON-WINTER | PUP |
|---|---|---|---|---|
| **GA, KY, TN** | ☐ Oct 15 - Nov 14 | ☒ Nov 15 - Mar 31 | ☒ Apr 1 - May 31, Aug 1- Oct 14 | ☐ Jun 1 - Jul 31 |
| **VA** | ☐ Sep 16 - Nov 15 | ☐ Nov 16 - Apr 14 | ☐ Apr 15 - May 31, Aug 1 – Sept 15 | ☐ Jun 1 - Jul 31 |
| **AL** | ☐ Oct 15 - Nov 14 | ☐ Nov 15 - Mar 15 | ☐ Mar 16 - May 31, Aug 1 - Oct 14 | ☐ Jun 1 - Jul 31 |
| **NC** | ☐ Oct 15 - Nov 14 | ☐ Nov 15 - Apr 15 | ☐ Apr 16 - May 31, Aug 1 - Oct 14 | ☐ Jun 1 - Jul 31 |
| **MS** | ☐ Oct 1 - Nov 14 | ☐ Nov 15 - Apr 14 | ☐ Apr 15 - May 31, Aug 1 – Sept 30 | ☐ Jun 1 - Jul 31 |

**If warranted, does project have flexibility for bat surveys (May 15-Aug 15):** ◉ **MAYBE** ○ **YES** ○ **NO**

**** For **PROJECT LEADS** whose projects will be reviewed by a Heritage Reviewer (Natural Resources Organization only), **STOP HERE**. Click File/ Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information. Otherwise continue to Step 5. ****

## SECTION 2: REVIEW OF BAT RECORDS (applies to projects with activities from Table 3 ONLY)

**STEP 5) Review of bat/cave records conducted by Heritage/OSAR reviewer?**

○ **YES** ○ **NO** (Go to Step 13)

Info below completed by:
- ☐ **Heritage Reviewer** (name) [ ] Date [ ]
- ☐ **OSAR Reviewer** (name) [ ] Date [ ]
- ☐ **Terrestrial Zoologist** (name) [ ] Date [ ]

Gray bat records: ☐ None ☐ Within 3 miles* ☐ Within a cave* ☐ Within the County

Indiana bat records: ☐ None ☐ Within 10 miles* ☐ Within a cave* ☐ Capture/roost tree* ☐ Within the County

Northern long-eared bat records: ☐ None ☐ Within 5 miles* ☐ Within a cave* ☐ Capture/roost tree* ☐ Within the County

Virginia big-eared bat records: ☐ None ☐ Within 6 miles* ☐ Within the County

Caves: ☐ None within 3 mi ☐ Within 3 miles but > 0.5 mi ☐ Within 0.5 mi but > 0.25 mi* ☐ Within 0.25 mi but > 200 feet* ☐ Within 200 feet*

**Bat Habitat Inspection Sheet completed?** ○ **NO** ○ **YES**

**Amount of SUITABLE habitat to be removed/burned (may differ from STEP 4e):** [ ] (○ **ac** ○ **trees**)* ○ **N/A**

**STEP 6) Provide any additional notes resulting from Heritage Reviewer records review in Notes box below <u>then</u> . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Go to Step 13**

**Notes from Bat Records Review** (e.g., historic record; bats not on landscape during action; DOT bridge survey with negative results):

## STEPS 7-12 To be Completed by Terrestrial Zoologist (if warranted):

**STEP 7) Project will involve**:

- ☐ Removal of suitable trees within 0.5 mile of P1-P2 Indiana bat hibernacula or 0.25 mile of P3-P4 Indiana bat hibernacula or any NLEB hibernacula.
- ☐ Removal of suitable trees within 10 miles of documented Indiana bat (or within 5 miles of NLEB) hibernacula.
- ☐ Removal of suitable trees > 10 miles from documented Indiana bat (> 5 miles from NLEB) hibernacula.
- ☐ Removal of trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity roost tree.
- ☐ Removal of suitable trees within 2.5 miles of Indiana bat roost trees or within 5 miles of Indiana bat capture sites.
- ☐ Removal of suitable trees > 2.5 miles from Indiana bat roost trees or > 5 miles from Indiana bat capture sites.
- ☐ Removal of documented Indiana bat or NLEB roost tree, if still suitable.
- ☐ N/A

**STEP 8) Presence/absence surveys were/will be conducted:** ◯ **YES** ◯ **NO** ◯ **TBD**

**STEP 9) Presence/absence survey results, on** ______ ◯ **NEGATIVE** ◯ **POSITIVE** ◯ **N/A**

**STEP 10)** Project ◯ **WILL** ◯ **WILL NOT** require use of Incidental Take in the amount of ______ ◯ **acres or** ◯ **trees** proposed to be used during the ◯ **WINTER** ◯ **VOLANT SEASON** ◯ **NON-VOLANT SEASON** ◯ **N/A**

**STEP 11) Available Incidental Take (prior to accounting for this project) as of** ______

| TVA Action | Total 20-year | Winter | Volant Season | Non-Volant Season |
|---|---|---|---|---|
| 5 Operate, Maintain, Retire, Expand, Construct Power Plants | | | | |

**STEP 12) Amount contributed to TVA's Bat Conservation Fund upon activity completion: $** ______ OR ◯ **N/A**

**TERRESTRIAL ZOOLOGISTS, after completing SECTION 2, review Table 4, modify as needed, and then complete section for Terrestrial Zoologists at end of form.**

## SECTION 3: REQUIRED CONSERVATION MEASURES

**STEP 13) Review Conservation Measures in Table 4 and ensure those selected are relevant to the project. If not, manually override and uncheck irrelevant measures, and explain why in ADDITIONAL NOTES below Table 4.**

Did review of Table 4 result in <u>ANY</u> remaining Conservation Measures in **<u>RED</u>**?

◯ **NO** (Go to Step 14)

◯ **YES** (STOP HERE; Submit for Terrestrial Zoology Review. Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information).

## Table 4. TVA's ESA Section 7 Programmatic Bat Consultation Required Conservation Measures

The Conservation Measures in Table 4 are automatically selected based on your choices in Tables 2 and 3 but can be manually overridden, if necessary. To Manually override, press the button and enter your name.

Manual Override

| Check if Applies to Project | Activities Subject To Conservation Measure | Conservation Measure Description |
|---|---|---|
| ■ | 15, 16, 17, 18, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96 | **NV1** - Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape. |
| ■ | 16, 25, 26, 37, 47, 52, 62, 63, 64, 65, 70, 71, 73, 78, 80, 82, 83, 86, 91 | **NV2** - Drilling, blasting, or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) **within a 0.5 mile radius of documented winter and/or summer roosts** (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites. |
| ■ | 16, 26, 62 | **NV3** - Drilling or blasting **within a 0.5 mile radius of documented cave** (or unconventional) roosts will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the roost site. |
| ■ | 16, 26, 62 | **NV4** - Drilling or blasting **within 0.5 miles of a documented roost site** (cave, tree, unconventional roost) that needs to occur when bats are present will first involve development of project-specific avoidance or minimization measures in coordination with the USFWS. |
| ☐ | 15, 26, 92 | **HP1** - Site-specific cases in which potential impact of human presence is heightened (e.g., conducting environmental or cultural surveys within a roost) will be closely coordinated with staff bat biologists to avoid/ minimize impacts below any potential adverse effect. Any take from these activities would be covered by TVA's Section 10 permit. |
| ☐ | 15, 26, 92 | **HP2** - Entry into roosts known to be occupied by federally listed bats will be communicated to the USFWS when impacts to bats may occur if not otherwise communicated (i.e., via annual monitoring reports per TVA's Section 10 permit). Any take from these activities would be covered by TVA's section 10 permit. |
| ☐ | 23 | **SHF1** - Fire breaks will be used to define and limit burn scope. |
| ■ | 17, 23, 34 | **SHF2** - Site-specific conditions (e.g., acres burned, transport wind speed, mixing heights) will be considered to ensure smoke is limited and adequately dispersed away from caves so that smoke does not enter cave or cave-like structures. |
| ☐ | 23 | **SHF3** - Acreage will be divided into smaller units to keep amount of smoke at any one time or location to a minimum and reduce risk for smoke to enter caves. |
| ■ | 17, 23, 34 | **SHF4** - If burns need to be conducted during April and May, when there is some potential for bats to present on the landscape and more likely to enter torpor due to colder temperatures, burns will only be conducted if the air temperature is 55° or greater, and preferably 60° or greater. |
| ☐ | 23 | **SHF5** - Fire breaks will be plowed immediately prior to burning, will be plowed as shallow as possible, and will be kept to minimum to minimize sediment. |
| ☐ | 23 | **SHF6** - Tractor-constructed fire lines will be established **greater than 200 feet from cave entrances**. Existing logging roads and skid trails will be used where feasible to minimize ground disturbance and generation of loose sediment. |
| ■ | 17, 22, 23, 32, 33, 34, 35, 36 | **SHF7** - Burning will only occur if site specific conditions (e.g. acres burned, transport wind speed, mixing heights) can be modified to ensure that smoke is adequately dispersed away from caves or cave-like structures. This applies to prescribed burns and burn piles of woody vegetation. |
| ■ | 17, 22, 23, 32, 33, 34, 35, 36 | **SHF8** - Brush piles will be burned a **minimum of 0.25 mile from documented, known, or obvious caves or cave entrances** and otherwise in the center of newly established ROW when proximity to caves on private land is unknown. |

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| ■ | 17, 23, 34 | **SHF9** - A **0.25 mile buffer of undisturbed forest** will be maintained around documented or known gray bat maternity and hibernation colony sites, documented or known Virginia big-eared bat maternity, bachelor, or winter colony sites, Indiana bat hibernation sites, and northern long-eared bat hibernation sites. Prohibited activities within this buffer include cutting of overstory vegetation, construction of roads, trails or wildlife openings, and prescribed burning. Exceptions may be made for maintenance of existing roads and existing ROW, or where it is determined that the activity is compatible with species conservation and recovery (e.g., removal of invasive species). |
| ■ | 33, 34 | **TR1*** - Removal of potentially suitable summer roosting habitat during time of potential occupancy has been quantified and minimized programmatically. TVA will track and document alignment of activities that include tree removal (i.e., hazard trees, mechanical vegetation removal) with the programmatic quantitative cumulative estimate of seasonal removal of potential summer roost trees for Indiana bat and northern long-eared bat. Project will therefore communicate completion of tree removal to appropriate TVA staff. |
| ■ | 33, 34 | **TR2** - Removal of suitable summer roosting habitat **within 0.5 mile of Priority 1/Priority 2 Indiana bat hibernacula, or 0.25 mile of Priority 3/Priority 4 Indiana bat hibernacula or any northern long-eared bat hibernacula** will be prohibited, regardless of season, with very few exceptions (e.g., vegetation maintenance of TL ROW immediately adjacent to a known cave). |
| ■ | 33, 34 | **TR3*** - Removal of suitable summer roosting habitat within documented bat habitat (i.e., within 10 miles of documented Indiana bat hibernacula, within 5 miles of documented northern long-eared bat hibernacula, within 2.5 miles of documented Indiana bat summer roost trees, within 5 miles of Indiana bat capture sites, within 1 mile of documented northern long-eared bat summer roost trees, within 3 miles of northern long-eared bat capture sites) will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff. |
| ■ | 33, 34 | **TR4*** - Removal of suitable summer roosting habitat within potential habitat for Indiana bat or northern long-eared bat will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff. |
| ■ | 33, 34 | **TR5** - Removal of any trees **within 150 feet of a documented Indiana bat or northern long-eared bat maternity summer roost tree** during non-winter season, range- wide pup season or swarming season (if site is within known swarming habitat), will first require a site-specific review and assessment. If pups are present in trees to be removed (determined either by mist netting and assessment of adult females, or by visual assessment of trees following evening emergence counts), TVA will coordinate with the USFWS to determine how to minimize impacts to pups to the extent possible. May include establishment of artificial roosts before removal of roost tree(s). |
| ■ | 33, 34 | **TR6** - Removal of a documented Indiana bat or northern long-eared bat roost tree that is still suitable and that needs to occur during non-winter season, range-wide pup season, or swarming season (if site is within known swarming habitat) will first require a site-specific review and assessment. If pups are present in trees to be removed (determined either by mist netting and assessment of adult females, or by visual assessment of trees following evening emergence counts), TVA will coordinate with USFWS to determine how to minimize impacts to pups to the extent possible. This may include establishment of artificial roosts before removal of roost tree(s). |
| ■ | 33, 34 | **TR7** (**Existing Transmission ROW only**) - **Tree removal within 100 feet of existing transmission ROWs will be limited to hazard trees**. On or adjacent to TLs, a hazard tree is a tree that is tall enough to fall within an unsafe distance of TLs under maximum sag and blowout conditions and/or are also dead, diseased, dying, and/or leaning. Hazard tree removal includes removal of trees that 1) currently are tall enough to threaten the integrity of operation and maintenance of a TL or 2) have the ability in the future to threaten the integrity of operation and maintenance of a TL. |
| ■ | 33, 34 | **TR8** (**TVA Reservoir Land only**) - Requests for removal of hazard trees on or adjacent to TVA reservoir land will be inspected by staff knowledgeable in identifying hazard trees per International Society of Arboriculture and TVA's checklist for hazard trees. Approval will be limited to trees with a defined target. |
| ■ | 33, 34 | **TR9** - If removal of suitable summer roosting habitat occurs when bats are present on the landscape, a funding contribution (based on amount of habitat removed) towards future conservation and recovery efforts for federally listed bats would be carried out. Project can consider seasonal bat presence/absence surveys (mist netting or emergence counts) that allow for positive detections without resulting in increased constraints in cost and project schedule. This will enable TVA to contribute to increased knowledge of bat presence on the landscape while carrying out TVA's broad mission and responsibilities. |

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| ☐ | 69, 77, 89, 91 | **AR1** - Projects that involve structural modification or demolition of buildings, bridges, and potentially suitable box culverts, will require assessment to determine if structure has characteristics that make it a potentially suitable unconventional bat roost. If so a survey to determine if bats may be present will be conducted. Structural assessment will include:<br>o Visual check that includes an exhaustive internal/external inspection of building to look for evidence of bats (e.g., bat droppings, roost entrance/exit holes); this can be done at any time of year, preferably when bats are active.<br>o Where accessible and health and safety considerations allow, a survey of roof space for evidence of bats (e.g., droppings, scratch marks, staining, sightings), noting relevant characteristics of internal features that provide potential access points and roosting opportunities. Suitable characteristic may include: gaps between tiles and roof lining, access points via eaves, gaps between timbers or around mortise joints, gaps around top and gable end walls, gaps within roof walling or around tops of chimney breasts, and clean ridge beams.<br>o Features with high-medium likelihood of harboring bats but cannot be checked visually include soffits, cavity walls, space between roof covering and roof lining.<br>o Applies to box culverts that are at least 5 feet (1.5 meters) tall and with one or more of the following characteristics. Suitable culverts for bat day roosts have the following characteristics:<br>• Location in relatively warm areas<br>• Between 5-10 feet (1.5-3 meters) tall and 300 ft (100 m) or more long<br>• Openings protected from high winds<br>• Not susceptible to flooding<br>• Inner areas relatively dark with roughened walls or ceilings<br>• Crevices, imperfections, or swallow nests<br>o Bridge survey protocols will be adapted from the Programmatic Biological Opinion for the Federal Highway Administration (Appendix D of USFWS 2016c, which includes a Bridge Structure Assessment Guidance and a Bridge Structure Assessment Form).<br>o Bat surveys usually are NOT needed in the following circumstances:<br>• Domestic garages /sheds with no enclosed roof space (with no ceiling)<br>• Modern flat-roofed buildings<br>• Metal framed and roofed buildings<br>• Buildings where roof space is regularly used (e.g., attic space converted to living space, living space open to rafters) or where all roof space is lit from skylights or windows. Large/tall roof spaces may be dark enough at apex to provide roost space |
| ☐ | 69, 77, 89, 91 | **AR2** - Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present). |
| ☐ | 91 | **AR3** - Bridge survey protocols will be implemented, either by permittee (e.g., state DOT biologists) or qualified personnel. If a bridge is determined to be in use as an unconventional roost, subsequent protocols will be implemented. |
| ☐ | 69, 89 | **AR4** - Removal of buildings with suitable roost characteristics within six miles of known or presumed occupied roosts for Virginia big-eared bat would occur between Nov 16 and Mar 31. Buildings may be removed other times of the year once a bat biologist evaluates a buildings' potential to serve as roosting habitat and determines that this species is not present and/or is not using structure(s). |

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| ■ | 16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 56, 61, 62, 63, 64, 65, 67, 69, 84, 89 | **SSPC1** (**Transmission only**) - Transmission actions and activities will continue to Implement A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities. This focuses on control of sediment and pollutants, including herbicides. Following are key measures:<br>o BMPs minimize erosion and prevent/control water pollution in accordance with state-specific construction storm water permits. BMPS are designed to keep soil in place and aid in reducing risk of other pollutants reaching surface waters, wetlands and ground water. BMPs will undertake the following principles:<br>• Plan clearing, grading, and construction to minimize area and duration of soil exposure.<br>• Maintain existing vegetation wherever and whenever possible.<br>• Minimize disturbance of natural contours and drains.<br>• As much as practicable, operate on dry soils when they are least susceptible to structural damage and erosion.<br>• Limit vehicular and equipment traffic in disturbed areas. Keep equipment paths dispersed or designate single traffic flow paths with appropriate road BMPs to manage runoff.<br>• Divert runoff away from disturbed areas.<br>• Provide for dispersal of surface flow that carries sediment into undisturbed surface zones with high infiltration capacity and ground cover conditions.<br>• Prepare drainage ways and outlets to handle concentrated/increased runoff.<br>• Minimize length and steepness of slopes. Interrupt long slopes frequently.<br>• Keep runoff velocities low and/or check flows.<br>• Trap sediment on-site.<br>• Inspect/maintain control measures regularly & after significant rain.<br>• Re-vegetate and mulch disturbed areas as soon as practical.<br>o Specific guidelines regarding sensitive resources and buffer zones:<br>• Extra precaution (wider buffers) within SMZs is taken to protect stream banks and water quality for streams, springs, sinkholes, and surrounding habitat.<br>• BMPs are implemented to protect and enhance wetlands. Select use of equipment and seasonal clearing is conducted when needed for rare plants; construction activities are restricted in areas with identified rare plants.<br>• Standard requirements exist to avoid adverse impacts to caves, protected animals, unique/ important habitat (e.g., cave buffers, restricted herbicide use, seasonal clearing of suitable habitat). |
| ■ | 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71, 73, 76, 77, 78, 80, 81, 82, 83, 86, 87, 88, 89, 90 | **SSPC2** - Operations involving chemical/fuel storage or resupply and vehicle servicing will be handled outside of riparian zones (streamside management zones) in a manner to prevent these items from reaching a watercourse. Earthen berms or other effective means are installed to protect stream channel from direct surface runoff. Servicing will be done with care to avoid leakage, spillage, and subsequent stream, wetland, or ground water contamination. Oil waste, filters, other litter will be collected and disposed of properly. Equipment servicing and chemical/fuel storage will be limited to locations greater than 300-ft from sinkholes, fissures, or areas draining into known sinkholes, fissures, or other karst features. |

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| ■ | 16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 69, 70, 71, 73, 76, 77, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91 | **SSPC3** (**Power Plants only**) - Power Plant actions and activities will continue to implement standard environmental practices. These include:<br>o Best Management Practices (BMPs) in accordance with regulations:<br>• Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy<br>• Maintain every site with well-equipped spill response kits, included in some heavy equipment<br>• Conduct Quarterly Internal Environmental Field Assessments at each sight<br>• Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant.<br>• When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage<br>o Construction Site Protection Methods<br>• Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites<br>• Storm drain protection device<br>• Check dam to help slow down silt flow<br>• Silt fencing to reduce sediment movement<br>o Storm Water Pollution Prevention (SWPP) Pollution Control Strategies<br>• Minimize storm water contact with disturbed soils at construction site<br>• Protect disturbed soil areas from erosion<br>• Minimize sediment in storm water before discharge<br>• Prevent storm water contact with other pollutants<br>• Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac)<br>o Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to<br>• Minimize fuel and chemical use Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy<br>• Maintain every site with well-equipped spill response kits, included in some heavy equipment<br>• Conduct Quarterly Internal Environmental Field Assessments at each sight<br>• Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant.<br>• When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage<br>o Construction Site Protection Methods<br>• Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites<br>• Storm drain protection device<br>• Check dam to help slow down silt flow<br>• Silt fencing to reduce sediment movement<br>o Storm Water Pollution Prevention (SWPP) Pollution Control Strategies<br>• Minimize storm water contact with disturbed soils at construction site<br>• Protect disturbed soil areas from erosion<br>• Minimize sediment in storm water before discharge<br>• Prevent storm water contact with other pollutants<br>• Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac)<br>o Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to minimize fuel and chemical use |
| ■ | 17, 22, 32, 33, 34, 35, 36 | **SSPC4** (**Transmission only**) - Woody vegetation burn piles associated with transmission construction will be placed in the center of newly established ROWs to minimize wash into any nearby undocumented caves that might be on adjacent private property and thus outside the scope of field survey for confirmation. Brush piles will be burned a **minimum of 0.25 miles from documented caves** and otherwise in the center of newly established ROW when proximity to caves on private land is unknown. |

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| ▣ | 17, 18, 21, 22, 24, 25, 26, 30, 31, 33, 34, 35, 36, 40, 46, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 66, 67, 68, 69, 70, 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 87, 88, 91, 93, 95, 96 | **SSPC5** (**26a, Solar, Economic Development only**) - Section 26a permits and contracts associated with solar projects, economic development projects or land use projects include standards and conditions that include standard BMPs for sediment and contaminants as well as measures to avoid or minimize impacts to sensitive species or other resources consistent with applicable laws and Executive Orders. |
| ▣ | 21, 54 | **SSPC6** - Herbicide use will be avoided **within 200 ft of portals associated with caves, cave collapse areas, mines and sinkholes** are capable of supporting cave-associated species. Herbicides are not applied to surface water or wetlands unless specifically labeled for aquatic use. Filter and buffer strips will conform at least to federal and state regulations and label requirements. |
| ▣ | 17, 21, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 54, 55 | **SSPC7** - Clearing of vegetation **within a 200-ft radius of documented caves** will be limited to hand or small machinery clearing only (e.g., chainsaws, bush-hog, mowers). This will protect potential recharge areas of cave streams and other karst features that are connected hydrologically to caves. |
| ▣ | 16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86 | **L1** - Direct temporary lighting away from suitable habitat during the active season. |
| ▣ | 16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86 | **L2** - Evaluate the use of outdoor lighting during the active season and seek to minimize light pollution when installing new or replacing existing permanent lights by angling lights downward or via other light minimization measures (e.g., dimming, directed lighting, motion-sensitive lighting). |

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

**Hide All Unchecked Conservation Measures**

○ HIDE

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**Hide Table 4 Columns 1 and 2 to Facilitate Clean Copy and Paste**

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**NOTES** (additional info from field review, explanation of no impact or removal of conservation measures).

**STEP 14) Save completed form (Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date") in project environmental documentation (e.g. CEC, Appendix to EA) AND send a copy of form to batstrategy@tva.gov**
**Submission of this form indicates that Project Lead/Applicant:**

☐ (name) is (or will be made) aware of the requirements below.

- Implementation of conservation measures identified in Table 4 is required to comply with TVA's Endangered Species Act programmatic bat consultation.
- TVA may conduct post-project monitoring to determine if conservation measures were effective in minimizing or avoiding impacts to federally listed bats.

***For Use by Terrestrial Zoologist Only***

☐ Terrestrial Zoologist acknowledges that Project Lead/Contact (name) ________ has been informed of any relevant conservation measures and/or provided a copy of this form.

☐ For projects that require use of Take and/or contribution to TVA's Bat Conservation Fund, Terrestrial Zoologist acknowledges that Project Lead/Contact has been informed that project will result in use of Incidental Take ________ ◯ ac ◯ trees and that use of Take will require $ ________ contribution to TVA's Conservation Fund upon completion of activity (amount entered should be $0 if cleared in winter).

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

February 7, 2020

Mr. E. Patrick McIntyre, Jr.
Executive Director
and State Historic Preservation Officer
Tennessee Historical Commission
State Historic Preservation Office
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), JOHN SEVIER FOSSIL (JSF) DAM REPAIR, HAWKINS COUNTY, TENNESSEE (36.38213, - 82.96619)

TVA proposes to make repairs to the dam originally associated with JSF, JSF Dam (Figures 1–3). Overtopping events at JSF Dam have caused damage to the grouted riprap armoring that protects the right (north) embankment dam and in some places, lowering the crest of the dam embankment below its original designed height. The scope of this project is to reestablish the design elevation of the crest to an elevation of 1,085 feet above mean sea level (amsl) and place slush grout on the downstream face over the existing grouted riprap armoring. The road that provides access to the dam would also be repaired prior to the start of work. Road-related repairs would include trimming of overhead limbs, as necessary; filling of low spots; and placing riprap in several washed-out areas and covering with two-inch stone. Riprap for the road would be added between elevations of 1,061 feet and 1,075 feet amsl. For embankment work, riprap boulders would be placed with a skid steer and/or track excavator to fill low spots on the crest. Slush grout would be added to the crest and downstream face with a line pump between elevations of 1,070 feet and 1,085 feet amsl. A laydown area would be established and no trees will be cut to accommodate equipment.

TVA determined the area of potential effects (APE) to be the footprint of the proposed project (embankment area, potential lay-down area, and access road repair area) and areas within a 0.5-mile radius (buffer) of the undertaking that would have a direct line of sight to the proposed project (see Figures 1 and 2). Areas within the 0.5-mile buffer that are not within view of the proposed project due to an obstructed line of sight (e.g. terrain, vegetation, and/or modern built environments) are not considered to be part of the APE.

Except for the work on the embankment, all of the other activities have been previously determined through consultation to be the type of activities not likely to have an effect on historic properties. The work on the embankment area, including the addition of riprap and slush grout on the crest and downstream face are activities with the potential to affect historic properties.

The portion of the project area affecting the earthen dam is limited to an artificial landform that lacks potential for archaeological sites (Figures 4-10). TVA constructed JSF Dam as a part of JSF, which operated from 1957-2012. Therefore, TVA considers all the proposed actions to have no potential for effects on archaeological sites.

TVA carried out a desktop review of the APE, using historic topographic maps, current satellite imagery, National Register of Historic Places (NRHP) data, previous survey reports, and historic architecture survey data depicted in the Tennessee Historical Commission (THC) viewer. The THC viewer data depicts one previously surveyed resource, HW-2935, a single-family dwelling constructed in 1900 (Figure 4). Satellite images indicate the house is in ruins and only two brick end chimneys remain extant. A ruinous silo also is associated with the property. THC data indicates the property is not NRHP-eligible. NRHP data indicates there are no NRHP-listed resources in the APE.

In 2008, TVA in consultation with the Tennessee State Historic Preservation Office (TN SHPO), determined JSF to be eligible for inclusion in the NRHP under Criteria A and C for its significance in the area of electrical development following World War II and as a representative example of International Style architecture. The recommended NRHP boundary is depicted in Figure 1. JSF was reassessed in 2012 to support consultation related to the retirement and decommissioning of JSF (Karpynec et. al 2012: 74). Through related consultation in 2013, TVA determined that JSF remained eligible for listing in the NRHP, and that the proposed decommissioning would result in an adverse effect. TVA developed and executed an MOA to mitigate adverse effects to JSF through the completion of Historic American Engineering Record (HAER) documentation and the installation of interpretive panels focused on the history and architecture of JSF and its significance to local, state, and regional history. TVA received concurrence from the TN SHPO in September 2014 that the adverse effects of the project had been adequately mitigated.

The JSF Dam was an original component of the design of JSF and a contributing resource to the NRHP-eligible JSF district (see Figures 1 and 2). It is a concrete gravity overflow spillway dam with decommissioned (plugged) vertical lift gates for silt control. It consists of a 340-foot section of grouted riprapped earthen dam (north side), a 100-foot non-overflow earthen embankment (south side) and a 363-foot concrete spillway section. All but 55 feet of the concrete section has a cascade-type overfall. The non-overflow embankment originally featured a crest at 1,103 feet amsl. The riprapped overflow embankment, where the proposed undertaking is focused, originally featured a crest at 1,085 feet amsl (see Figures 6–10) (TVA 1969:309; Karpynec et. al 2012: 74).

Since the retirement and decommissioning of JSF, the majority of the facility has been demolished, disassembled, or converted to support the adjacent John Sevier Combined Cycle Plant (JSCC). The JSF Dam and switchyard are among the only remaining resources previously determined to be contributing to JSF. Thus, TVA finds that JSF no longer retains integrity to remain eligible for listing in the NRHP. The significance of JSF Dam is distinctly tied to its function and operation as a part of JSF. Therefore, without the setting and association to the larger JSF plant, JSF Dam is no longer eligible for listing in the NRHP as a contributing element of JSF.

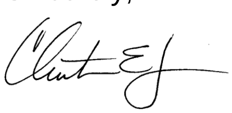
The proposed project would require repair of the earthen embankment section of the JSF Dam as well as the access road to the embankment. TVA finds that the JSF Dam and the remainder of JSF is no longer contributing or eligible for listing in the NRHP. Therefore, TVA finds that the proposed project would have no effect to historic properties.

Pursuant to 36 CFR 800.4(d)(1), we are notifying you of TVA's finding of no historic properties affected, providing the documentation specified in § 800.11(e), and providing you an opportunity to review this finding. In addition, we are seeking your agreement with TVA's finding that JSF and JSF Dam are no longer eligible for listing in the NRHP given a lack of integrity and that the undertaking as currently planned will have no effect on historic properties.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding properties within the proposed project's APE that may be of religious and cultural significance to them and eligible for the NRHP.

Please contact Hallie Hearnes in Knoxville by telephone, (865) 632-3463 or by email, hahearnes@tva.gov with your comments.

Sincerely,



Clinton E. Jones
Manager
Cultural Compliance

HAH:ABM
Enclosures
cc (Enclosures):
Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

**References Cited**


Karpynec, Ted, Jared Barrett, Larry McKee, and Jeff Holland

2012 Cultural Resources Assessment of the Proposed Retirement of the TVA John Sevier Fossil Plant, Hawkins County, Tennessee, Draft Report. Prepared by TRC Environmental Corporation, Nashville, Tennessee for Tennessee Valley Authority.

Tennessee Valley Authority

1969 Report No. 32-200 John Sevier Steam Plant Final Design Report. Tennessee Valley Authority, Engineering and Construction Divisions, Knoxville, Tennessee.

INTERNAL COPIES ONLY, NOT TO BE INCLUDED WITH OUTGOING LETTER:

S. Dawn Booker, WT 11C-K
James M. Bryant, WT 10-C-K
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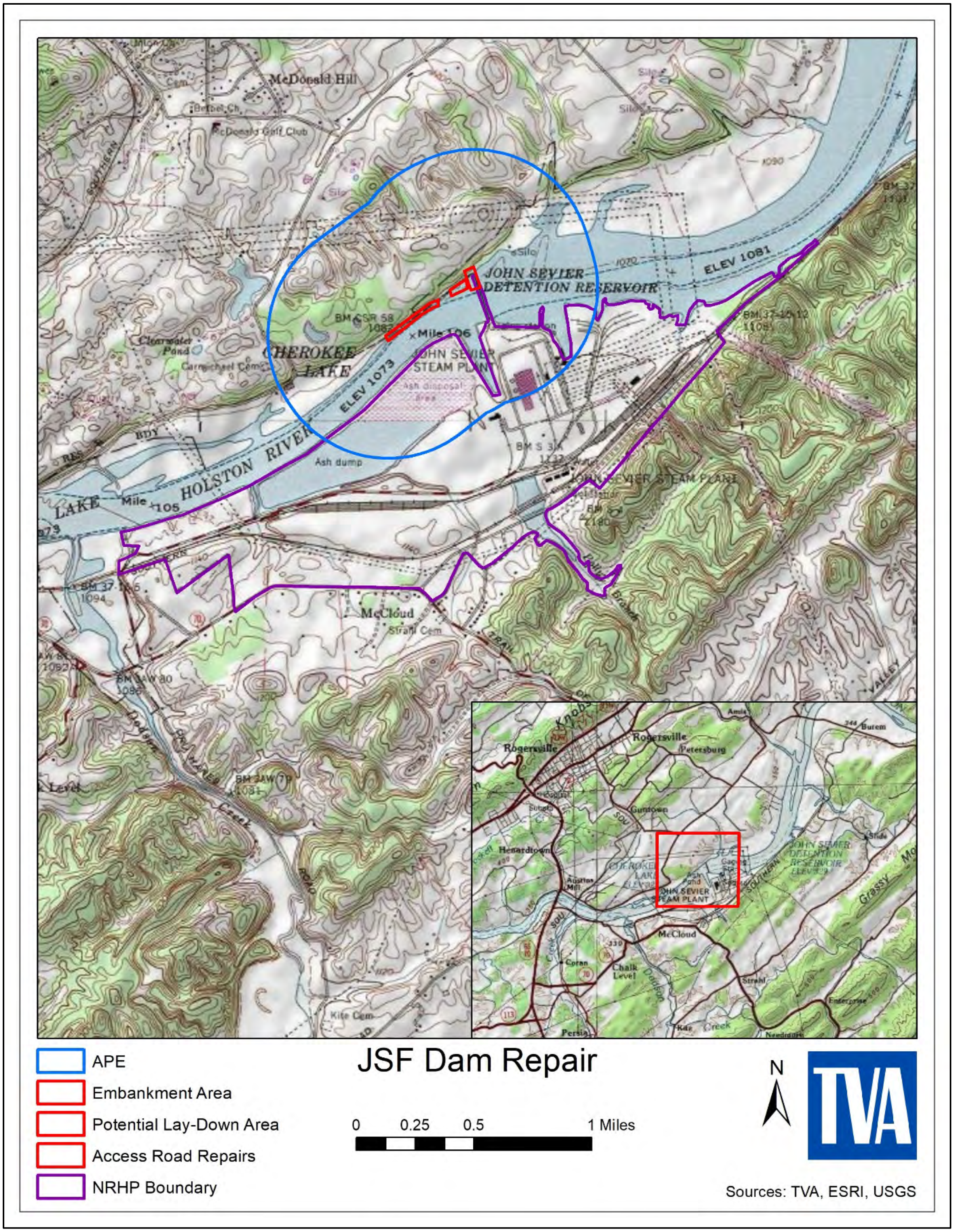


Figure 1. APE, project footprint (embankment area, potential lay-down area, and access road repair area), and JSF NRHP boundary depicted on portions of the Burem, Tennessee and McCloud, Tennessee 7.5-minute series topographic quadrangles.

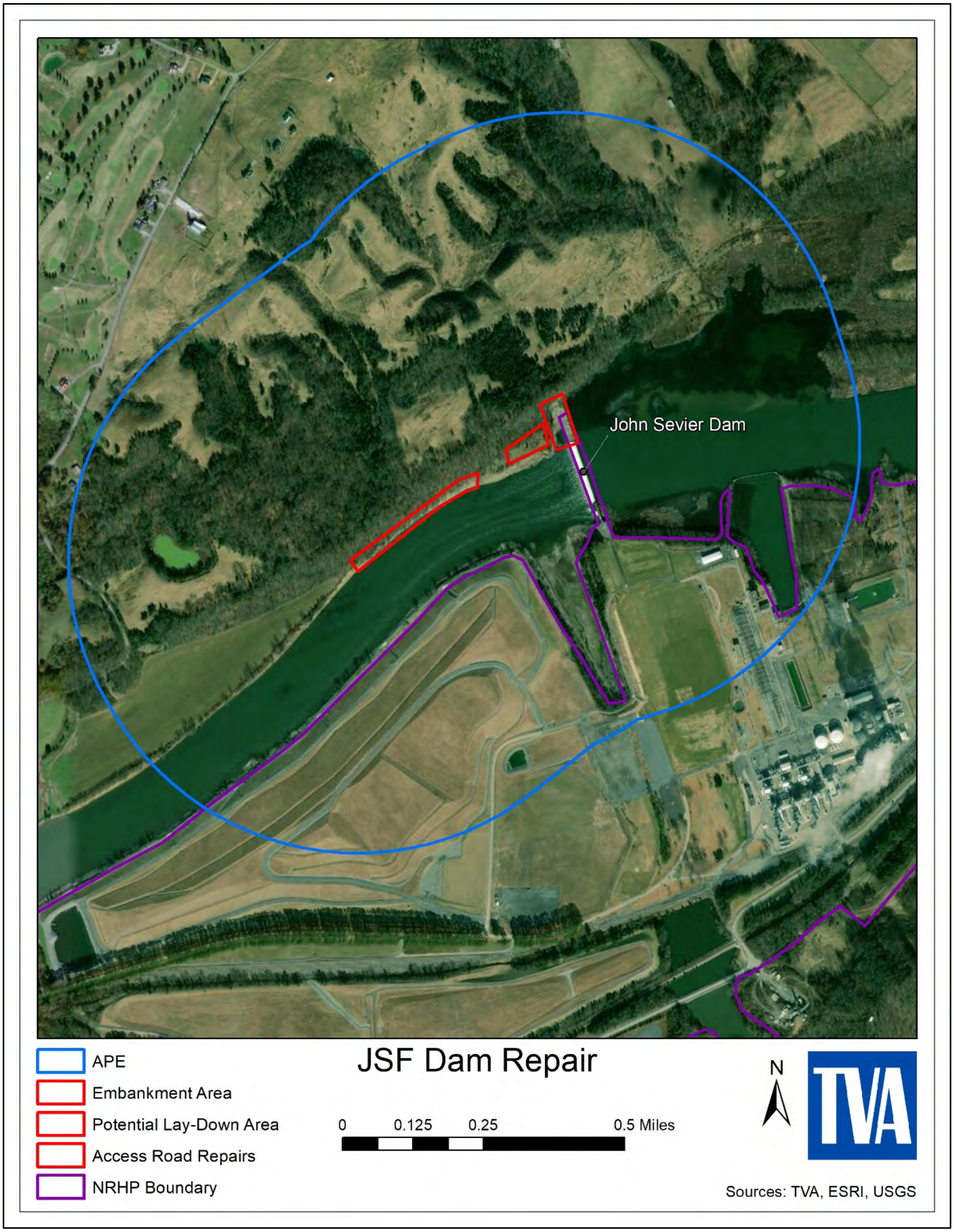


Figure 2. APE, project footprint (embankment area, potential lay-down area, and access road repair area), and JSF NRHP boundary depicted on satellite image.

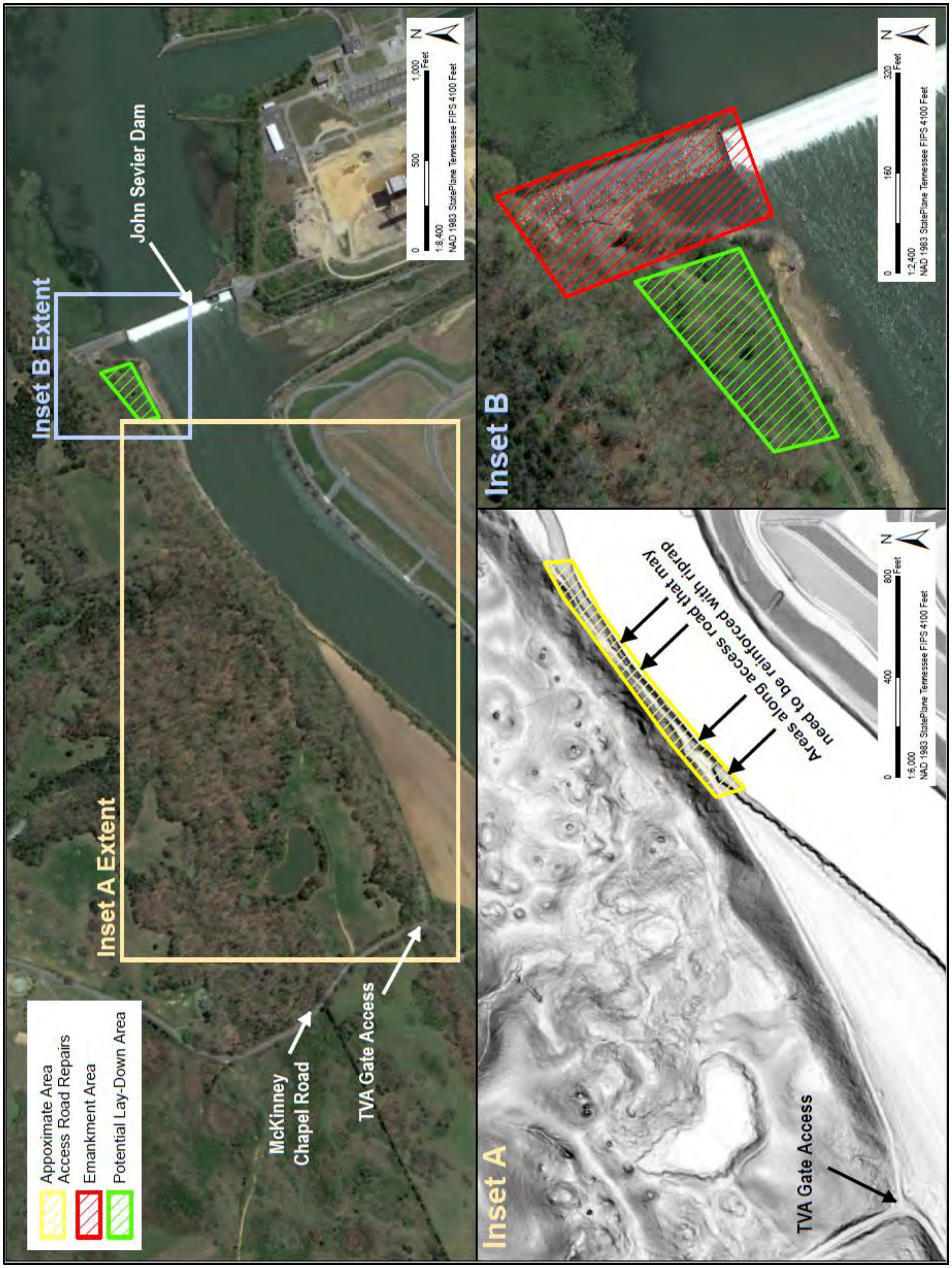


Figure 3. Proposed project areas (embankment, potential lay-down, and access road repair).

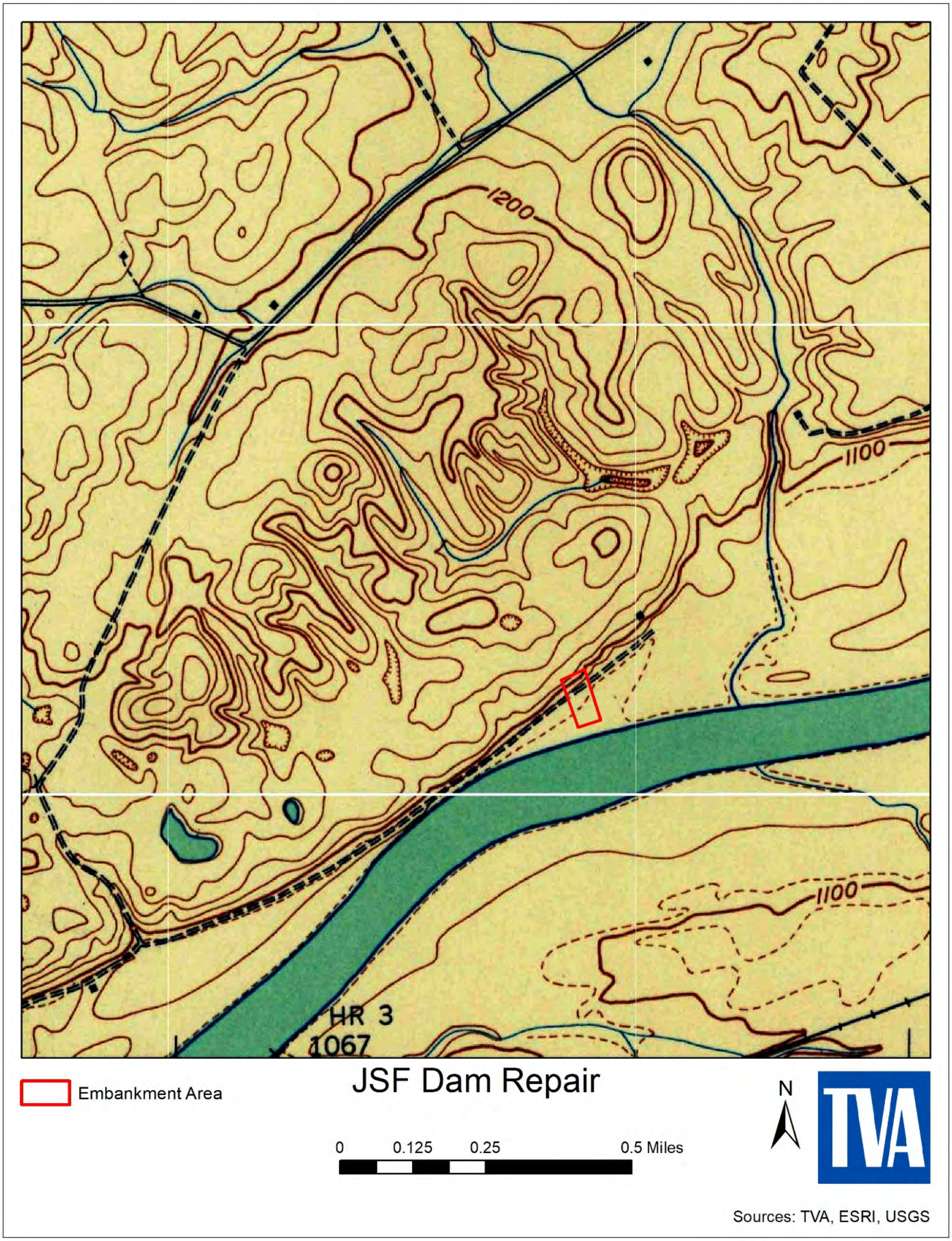


Figure 4. Embankment area depicted on a 1940 Burem, Tennessee USGS topographic quadrangle.

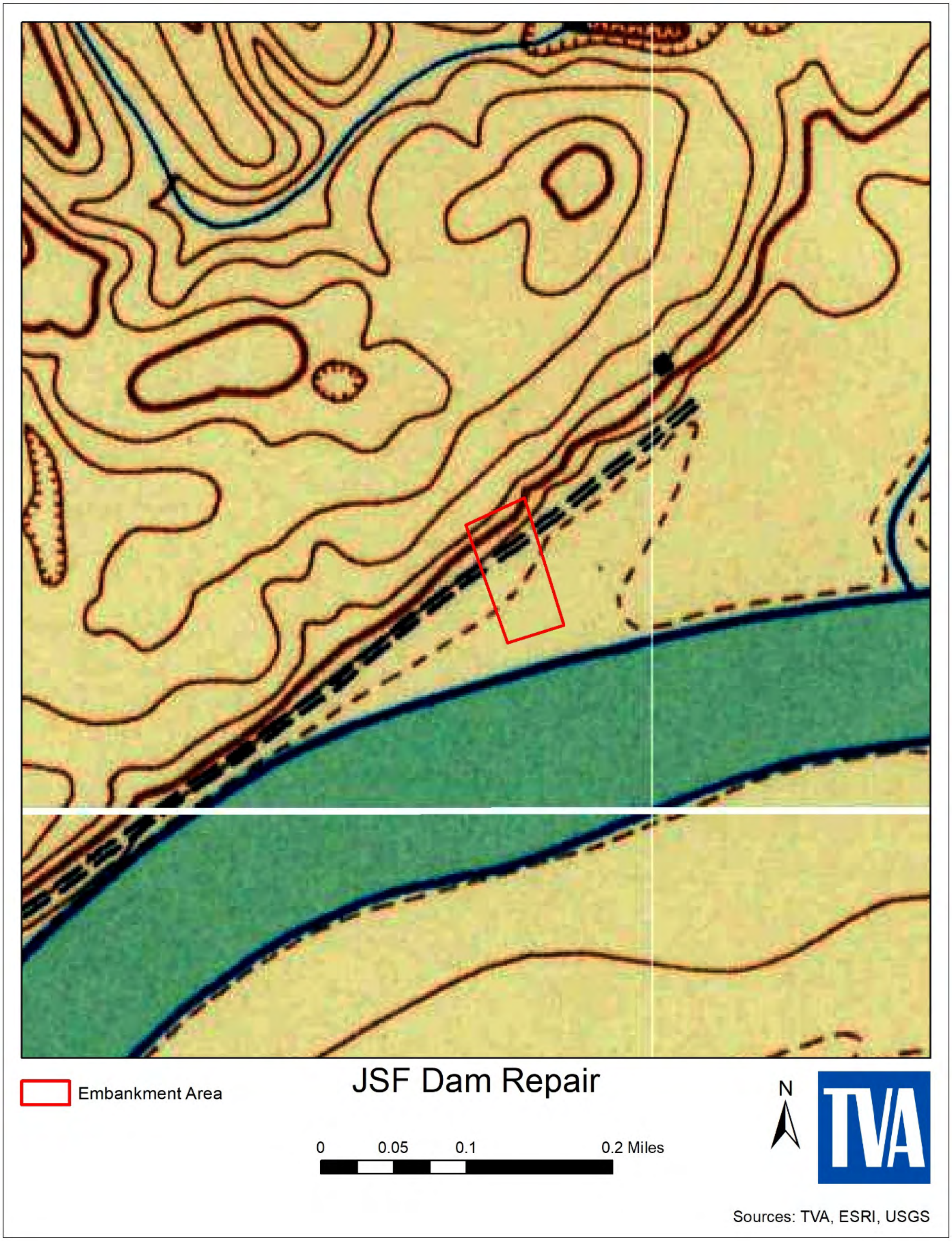


Figure 5. Detail of embankment area depicted on a 1940 Burem, Tennessee USGS topographic quadrangle.

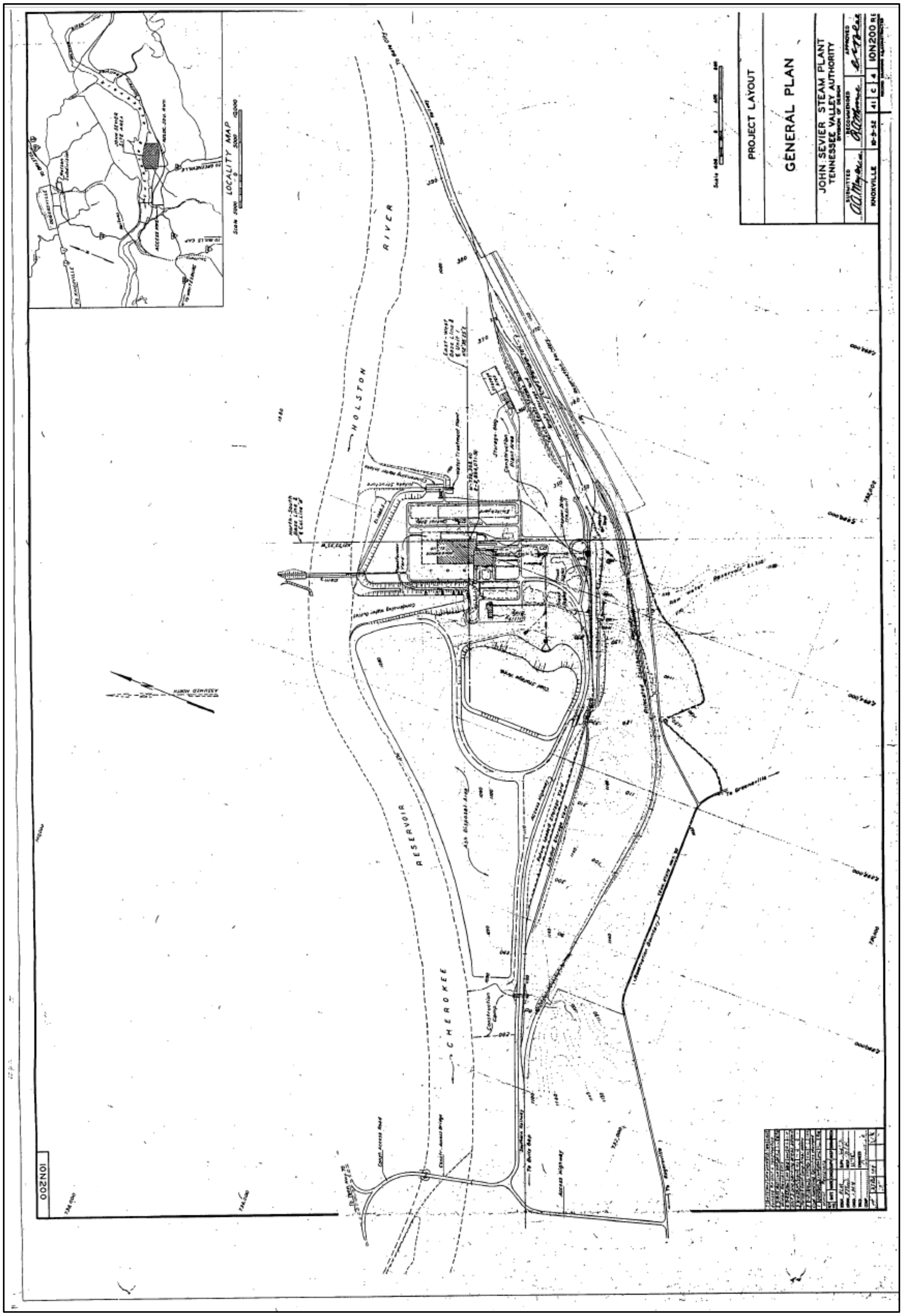


Figure 6.  1952 Site plan of former JSF facility (TVA 1969).

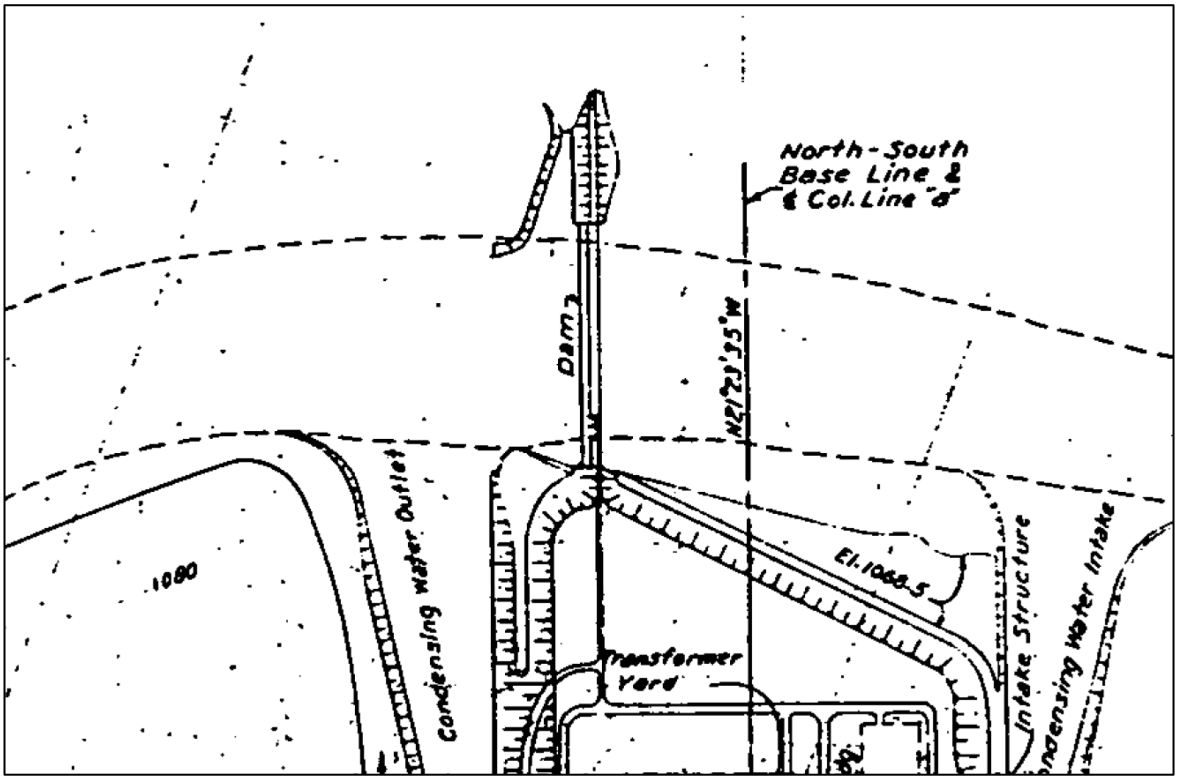

Figure 7. Plan drawing of dam on site plan of former JSF Facility (TVA 1969).

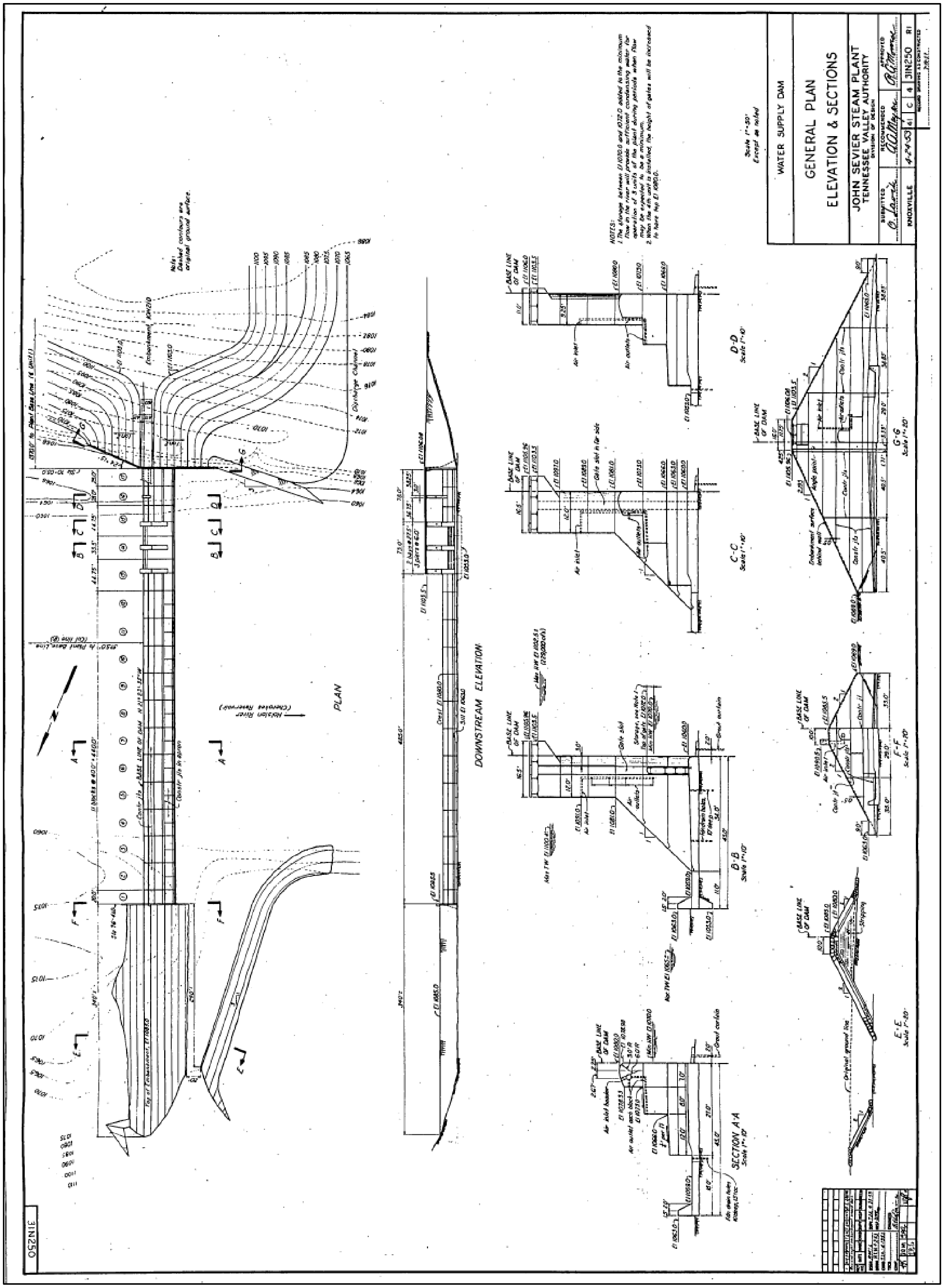


Figure 8. 1953 Plan and elevation drawing of JSF Dam (TVA 1969).

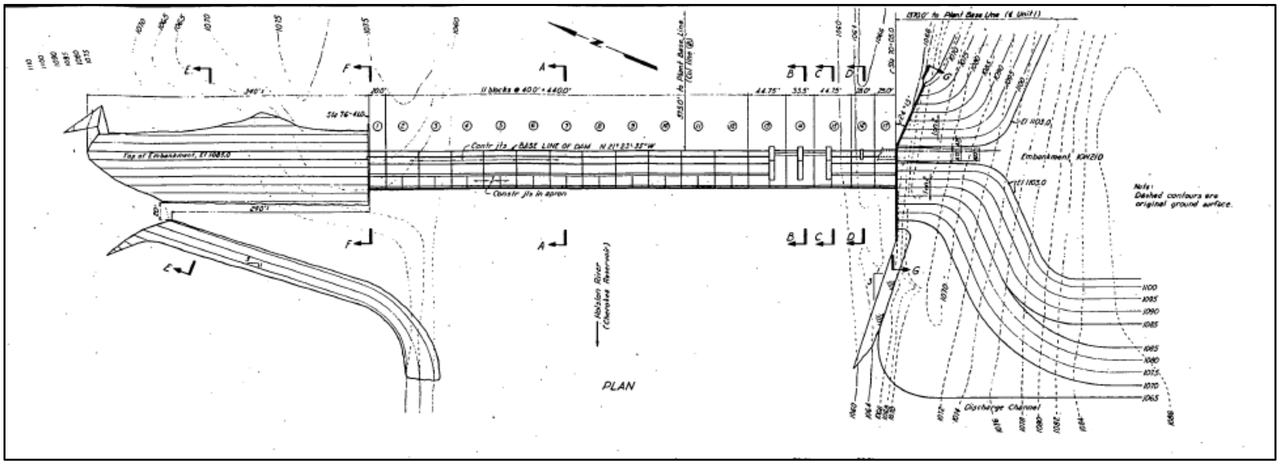


Figure 9.  1953 Plan drawing of JSF Dam (TVA 1969).

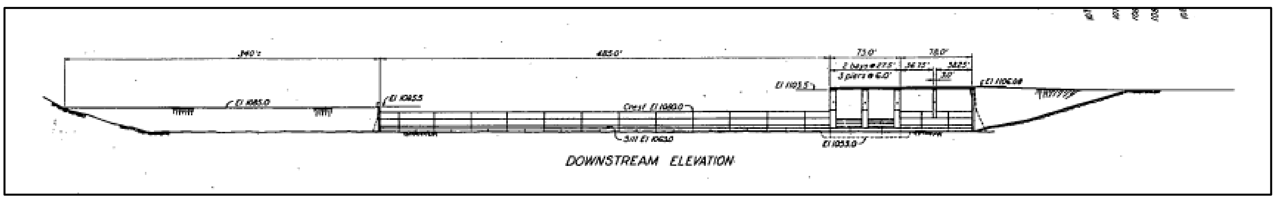


Figure 10.  1953 Elevation drawing of JSF Dam (TVA 1969).

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

February 13, 2020

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

RE: TVA / Tennessee Valley Authority, John Sevier Fossil (JSF) Dam Repair, Rogersville, Hawkins County, TN

Dear Mr. Jones:

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

After considering the documentation submitted, it is our opinion that there are no National Register of Historic Places listed or eligible properties affected by this undertaking. We have made this determination because either: no National Register listed or eligible Historic Properties exist within the undertaking's area of potential effects, the specific location, size, scope and/or nature of the undertaking and its area of potential effects precluded affects to Historic Properties, the undertaking will not alter any characteristics of an identified eligible or listed Historic Property that qualify the property for listing in the National Register, or it will not alter an eligible Historic Property's location, setting or use. We have no objections to your proceeding with your undertaking.

If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. If you are applying for federal funds, license or permit, you should submit this letter as evidence of consultation under Section 106 to the appropriate federal agency, which, in turn, should contact us as required by 36 CFR 800. If you represent a federal agency, you should submit a formal determination of eligibility and effect to us for comment. You may direct questions or comments to Claire Meyer (615-770-1099).

Sincerely,

E. Patrick McIntyre, Jr.

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

EPM/cem

# Appendix C – Photolog of Road Conditions Along McKinney Chapel Road, Rogersville, Tennessee, July 2023

**Photolog of Road Conditions Along McKinney Chapel Road at the John Sevier Dam, Rogersville, Tennessee, July 2023**

John Sevier Dam Modification
Final Environmental Assessment

Tennessee Valley Authority

**Photos by: TVA**
**Date: July 11, 2023**

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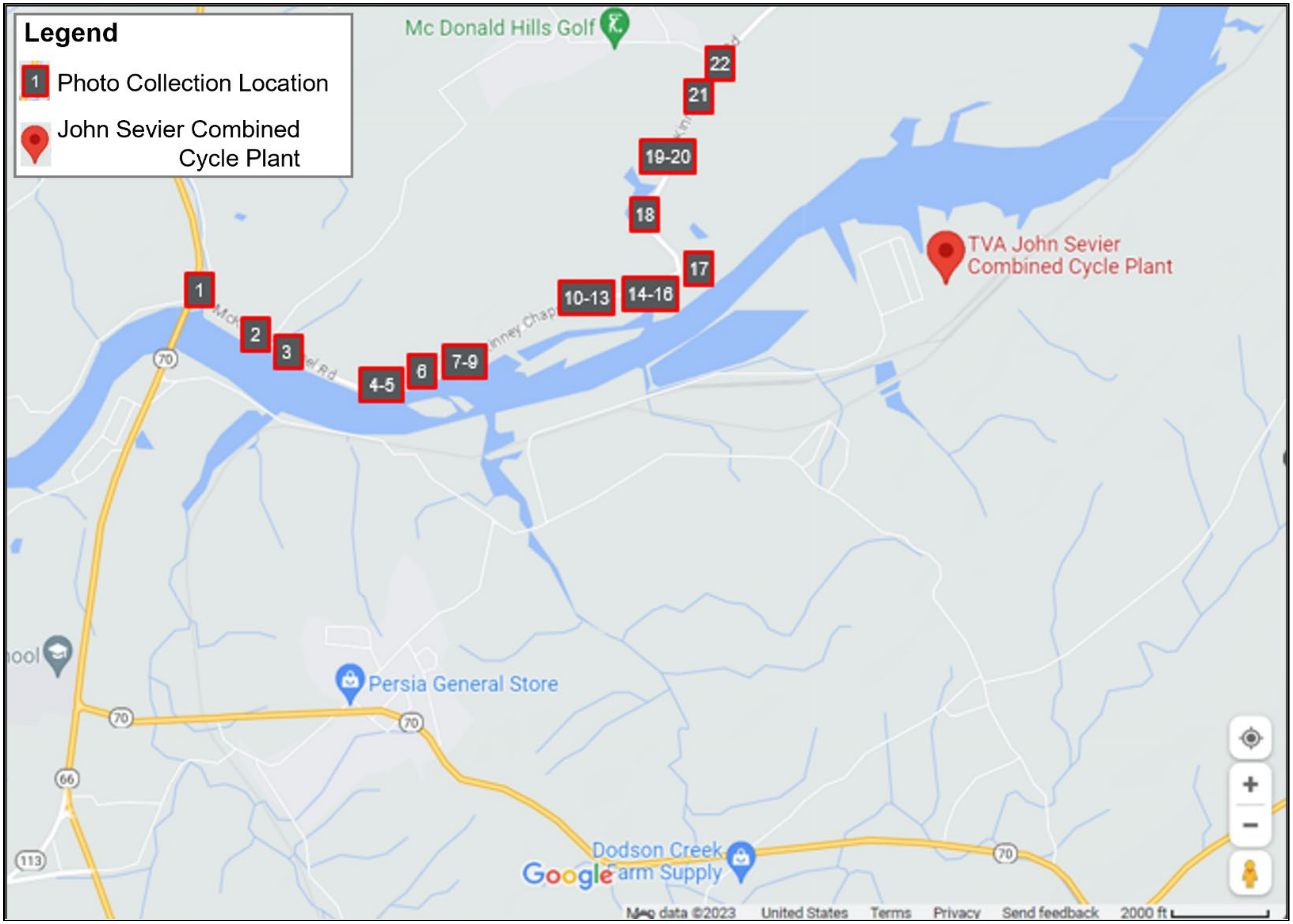


Figure 1. Photo Collection Locations

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| **Photograph 1:** McKinney Chapel Road |
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| **Photograph 2:** McKinney Chapel Road |
|  |

**Photograph 3:** McKinney Chapel Road

**Photograph 4:** McKinney Chapel Road

**Photograph 5:** McKinney Chapel Road

**Photograph 6:** McKinney Chapel Road

**Photograph 7:** McKinney Chapel Road

**Photograph 8:** McKinney Chapel Road

**Photograph 9:** McKinney Chapel Road'

**Photograph 10:** McKinney Chapel Road

**Photograph 11:** McKinney Chapel Road

**Photograph 12:** McKinney Chapel Road

**Photograph 13:** McKinney Chapel Road

**Photograph 14:** McKinney Chapel Road

**Photograph 15:** McKinney Chapel Road

**Photograph 16:** McKinney Chapel Road

**Photograph 17:** McKinney Chapel Road

**Photograph 18:** McKinney Chapel Road

| **Photograph 19:** McKinney Chapel Road |
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| **Photograph 20:** McKinney Chapel Road |
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**Photograph 21:** McKinney Chapel Road

**Photograph 22:** McKinney Chapel Road

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