**Document Type:** EA-Administrative Record
**Index Field:** Environmental Assessment (EA)
**Project Name:** BLN Property Disposal
**Project Number:** 2016-23

# BELLEFONTE PROPERTY DISPOSAL
# **FINAL ENVIRONMENTAL ASSESSMENT**
## **Jackson County, Alabama**

**Prepared by:**
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July 2017

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# Symbols, Acronyms, and Abbreviations

| | |
|---|---|
| °F | degrees Fahrenheit |
| % | percent |
| AADT | Average Annual Daily Traffic |
| ADEM | Alabama Department of Environmental Management |
| AL | Alabama |
| APE | Area of Potential Effect |
| AR4 | Intergovernmental Panel on Climate Change Fourth Assessment |
| BEA | Bureau of Economic Analysis |
| BLN | Bellefonte Nuclear Plant |
| CESQG | conditionally exempt small quantity generator |
| CFR | Code of Federal Regulations |
| $CH_4$ | methane |
| $CO_2$ | carbon dioxide |
| COLA | Combined Operating License |
| dB | decibel |
| dBA | A-weighted decibel |
| dbh | diameter at breast height |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| EPA | U.S. Environmental Protection Agency |
| ER | Environmental Report |
| FEIS | Final Environmental Impact Statement |
| GHG | greenhouse gas |
| HFC | hydrofluorocarbon |
| HUC | Hydrologic Unit Code |
| kg | kilogram |
| kV | kilovolt |
| kW | kilowatt |
| $L_{dn}$ | Day-Night Sound Level |
| mg/L | milligrams per liter |
| msl | mean sea level |
| MWe | Megawatt electric |
| NAAQS | National Ambient Air Quality Standards |
| $NO_x$ | nitrous oxide |
| NEPA | National Environmental Policy Act |
| NPDES | National Pollutant Discharge Elimination System |
| NRC | Nuclear Regulatory Commission |
| NRHP | National Register of Historic Places |
| OMB | Office of Management and Budget |
| PCB | Polychlorinated Biphenyl |
| PFC | perfluorocarbon |
| $PM_{10}$ | particulate matter less than 10 microns in diameter |
| $PM_{2.5}$ | particulate matter less than 2.5 microns in diameter |
| RCRA | Resource Conservation and Recovery Act |
| REMP | Radiological Environmental Monitoring Program |
| ROW | right-of-way |
| RSL | Regional Screening Levels |
| SEIS | Supplemental Environmental Impact Statement |
| $SF_6$ | sulfur hexafluoride |
| SPCC | spill prevention, control, and countermeasure plan |
| SQG | small quantity generator |
| SWPPP | Stormwater Pollution Prevention Plan |

| | |
|---|---|
| TRM | Tennessee River Mile |
| TVA | Tennessee Valley Authority |
| TVARAM | TVA Rapid Assessment Method |
| U.S. | United States |
| US-72 | U.S. Highway 72 |
| USACE | U.S. Army Corps of Engineers |
| USCB | U.S. Census Bureau |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |

# EXECUTIVE SUMMARY

In May 2016, the TVA Board of Directors authorized the sale of the Bellefonte Nuclear Plant (BLN) Property. The BLN Property occupies approximately 1,400 acres of the approximately 1,600 acre BLN Reservation located near the Town of Hollywood in Jackson County, Alabama. The Board directed TVA staff to update and supplement the existing environmental review record in light of the purchaser's proposed use of the site and conditioned completion of the sale on TVA's Chief Executive Officer's determination that the environmental review satisfactorily addressed potential environmental impact.

The BLN Property was auctioned on November 14, 2016, and Nuclear Development, LLC, was the successful bidder. Nuclear Development plans to complete and operate the two unfinished nuclear units at the BLN Property. This EA presents the results of TVA's review and update of the existing environmental record and provides an opportunity for public input into the process.

TVA's review did not reveal environmental conditions that are substantially different from those previously assessed during past environmental reviews. Nothing suggests that completing the two nuclear units on the site would result in potential environmental impacts that were not considered by TVA in all its previous studies when considering the BLN Property for nuclear use.

The decision that TVA's Chief Executive Officer must make is whether to complete or to terminate transfer of the site to Nuclear Development. TVA's proposed action is to complete the sale and transfer the site.

# CHAPTER 1 - PURPOSE OF AND NEED FOR ACTION

## 1.1 Introduction and Background

In May 2016, the Tennessee Valley Authority (TVA) Board of Directors (Board) authorized the sale of the Bellefonte Nuclear Plant (BLN) Property. The Board directed TVA staff to update and supplement the existing environmental review record in light of the purchaser's proposed use of the site and conditioned completion of the sale on TVA's Chief Executive Officer's determination that the environmental review satisfactorily addressed potential environmental impacts. The BLN Property was auctioned on November 14, 2016, and Nuclear Development, LLC, (Nuclear Development) was the successful bidder. The purpose of this Environmental Assessment (EA) is to update and supplement existing environmental information and data in light of the purchase of the site by Nuclear Development as directed by the Board.

The BLN Property is located on a peninsula on Guntersville Reservoir in Jackson County near Hollywood, Alabama (Figure 1-1). Two partially constructed at least 1,200-megawatt electric (MWe) Babcock and Wilcox pressurized light water reactors are included as part of the BLN Property. When TVA placed the reactor units in deferred status with the Nuclear Regulatory Commission (NRC) in 1988, Unit 1 was approximately 90 percent complete, and Unit 2 was approximately 58 percent complete. Additional facilities on the site include 161- and 500-kilovolt (kV) switchyards and associated transmission lines, office buildings, simulator building, training center, warehouses, Pole Yard Training Center, three firing ranges, parking lots, railroad spurs, roads, laydown areas, and a helicopter landing pad. The proposed sale boundaries include the approximately 1,400 acres shown in Figure 1-2. The BLN Property consists of approximately 1,400 acres of the approximately 1,600 acre BLN Reservation; TVA would retain ownership of the majority of the shoreline (approximately 200 acres).

After halting construction at the BLN Property, TVA has considered various uses for the site. In 1997, TVA considered but ultimately decided against using some of the infrastructure to construct a natural gas power plant (*Final Environmental Impact Statement [EIS] for the Bellefonte Conversion Project*, Oct 1997). In 2007, TVA submitted a Combined License Application to NRC for the construction and operation of two new AP-1000 units, and in 2010, TVA completed a *Supplemental EIS for a Single Nuclear Unit at the Bellefonte Plant Site* (SEIS) which compared completion of one Babcock and Wilcox unit to one AP-1000 unit. Although the TVA Board issued a Record of Decision in 2011 indicating an intention to complete a single Babcock and Wilcox unit, subsequent changes in TVA's power generation needs postponed this project indefinitely. TVA continues to hold NRC Construction Permits for BLN Units 1 and 2.

While the site would otherwise have strategic value to TVA as a possible location for a large generation facility, TVA determined in its 2015 *Integrated Resource Plan* that it likely would not have a need for such facilities for the next 20 years. In light of this determination, in April 2016 TVA provided the public 30 days to comment on whether TVA should continue to retain the site or sell it. Approximately 79 people or entities responded with a majority supporting the sale of the site.

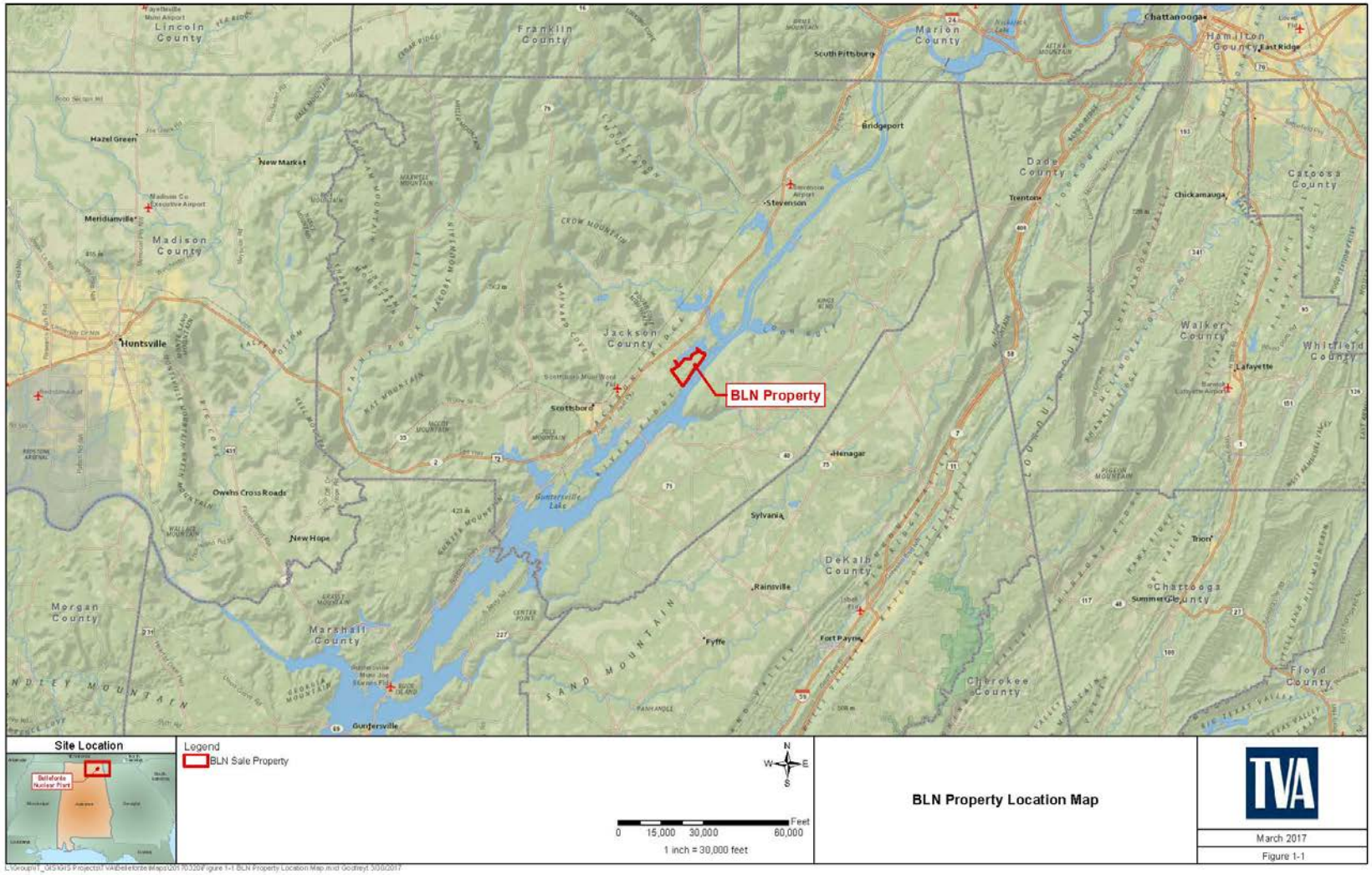


**Figure 1-1. Location of the BLN Property**

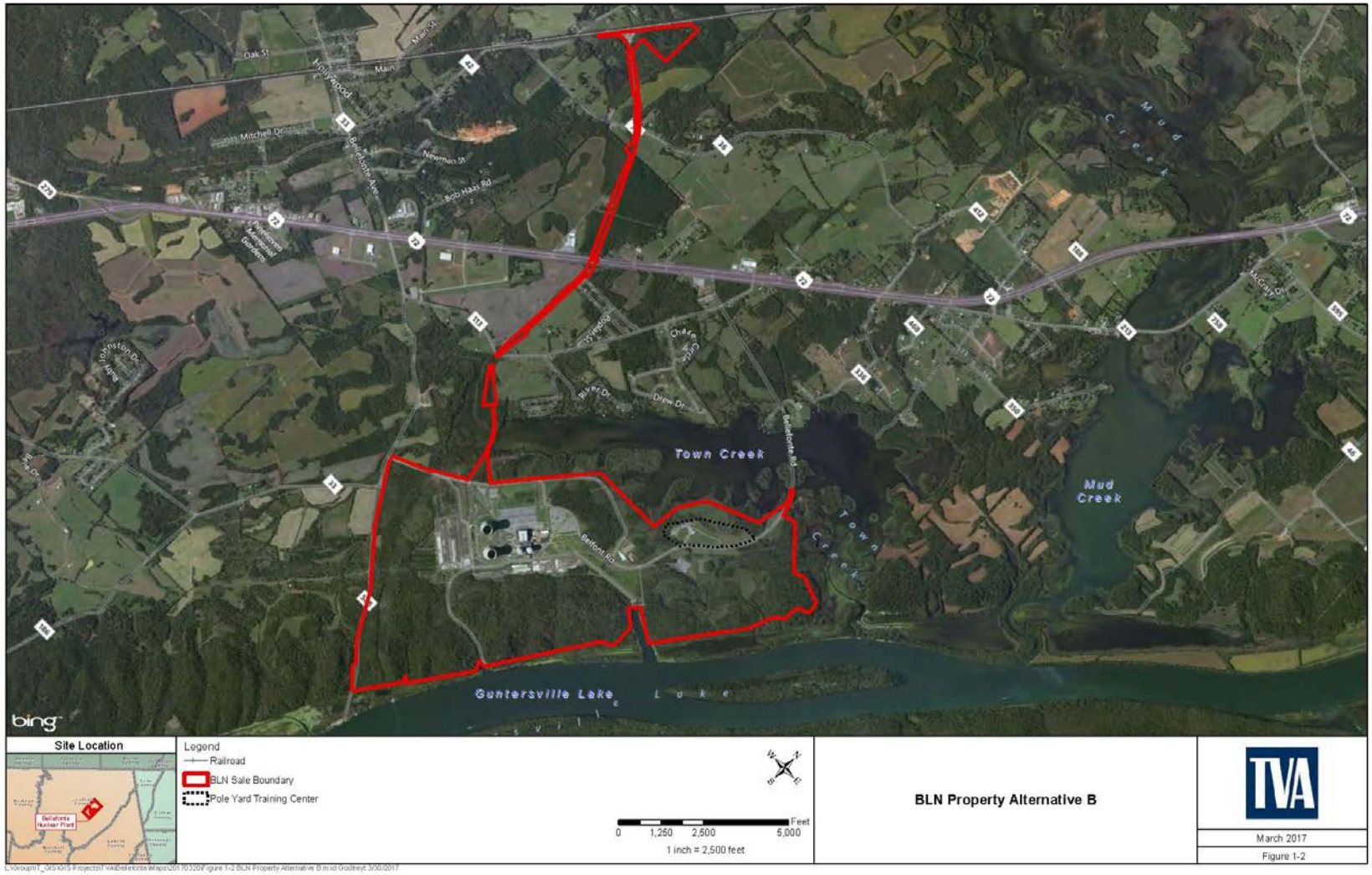


**Figure 1-1. BLN Property Overview Map**

## 1.1 Purpose and Need

TVA previously decided to construct a nuclear power plant at the BLN Property and the infrastructure that exists on the site was built to support a nuclear plant. Subsequent to the preparation and release of the initial EIS in 1974 that addressed construction and operation of the two Babcock and Wilcox pressurized water reactors, TVA has conducted a number of additional environmental reviews, including the Supplemental EIS in 2010 that considered finishing one of the two partially-completed nuclear units or building a single AP-1000 unit. Section 1.3 of this EA identifies the environmental reviews that TVA has conducted for the BLN Property. These reviews provide substantial information about environmental conditions and potential impacts associated with development of the site, primarily for nuclear power generation. Although the more recent reviews have updated baseline information, the TVA Board tasked staff with ensuring that available information continues to adequately reflect current conditions and determining whether the potential impacts associated with the proposed use of the site by the purchaser are satisfactorily addressed by the collective reviews and updated analysis. Because the purchaser Nuclear Development plans to complete the unfinished nuclear units, almost all of the previous reviews that TVA has conducted apply directly to this proposed use.

## 1.2 Decision to be Made

The decision that TVA's Chief Executive Officer must make is whether to complete or to terminate transfer of the site to Nuclear Development. This EA is being prepared to update existing environmental information and impact analyses and to provide a vehicle for public input into the update. As discussed below, TVA's review at this stage has not revealed environmental conditions that are substantially different from those previously assessed and nothing suggests that completing the two nuclear units would result in potential environmental impacts that were not considered by TVA when it decided to dedicate and rededicate the BLN Property to a nuclear use.

## 1.3 Related Documents

Related documents and materials were reviewed concerning this assessment. The contents of these documents help describe the BLN Property and are incorporated by reference as appropriate. These are listed below.

- TVA, 1974, *Final Environmental Statement, Bellefonte Nuclear Plant Units 1 and 2* (TVA 1974 FES)
- Atomic Energy Commission (AEC), 1974, *Final Environmental Statement Related to Construction of Bellefonte Nuclear Plant Units 1 and 2, Docket Nos. 50-438 and 50-439* (AEC 1974 FES)
- TVA, 1976, *Bellefonte Nuclear Plant Units 1 and 2 Environmental Report, Operating License Stage* (1976 ER)
- TVA, 1991, *Bellefonte Nuclear Plant Units 1 & 2, Final Safety Analysis Report, Amendment 30* (1991 FSAR)
- TVA 1993, *Environmental Impact Statement Review, Bellefonte Nuclear Plant White Paper* (1993 EIS)

- TVA, 1997, *Final Environmental Impact Statement for the Bellefonte Conversion Project* (1997 FEIS)
- TVA, 2001, *Guntersville Reservoir Land Management Plan (RLMP), Jackson and Marshall Counties, Alabama, and Marion County, Tennessee (2001 Guntersville RLMP)*
- TVA, 2006, *Final Environmental Assessment Bellefonte Nuclear Plant Redress, Jackson County, Alabama* (2006 FEA)
- TVA, 2008, *Bellefonte Nuclear Plant Units 3 & 4, COL Application Part 3, Environmental Report, Revision 1* (2008 COLA ER)
- TVA, 2008, *Activities at Bellefonte Nuclear Plant Related to Future Site Use, Jackson County, Alabama* (2008 Future Site Use)
- TVA, 2009, *Bellefonte Nuclear Plant Units 3 & 4, COL Application Part 2, Final Safety Analysis Report, Revision 1* (2009 COLA FSAR)
- TVA, 2010, *Final Supplemental EIS for a Single Nuclear Unit at the Bellefonte Plant Site* (2010 SEIS)
- TVA, 2011, *Integrated Resource Plan: TVA's Environmental and Energy Future* (2011 IRP)
- TVA, 2014, *Bellefonte Site Utility Improvements Final Environmental Assessment* (2014 FEA)
- TVA, 2015, *Integrated Resource Plan* (2015 IRP)
- TVA, 2015, *Integrated Resource Plan 2015 Final Supplemental Environmental Impact Statement* (2015 IRP SEIS)

## 1.4 Scope of the Environmental Assessment

Several environmental reviews, including EISs and supplements, have been conducted in the past for this site that support construction and operation of two types of nuclear generation, and fossil fuel electric generation including pulverized coal, natural gas combined cycle, and integrated gasification combined cycle (see Section 1.3). TVA's evaluation of these collective reviews indicates that updates to this body of analysis are needed to provide adequate coverage for the proposed action. It has been 20 years since environmental resource data has been collected for the entire 1,600 acre BLN Reservation. Much of the more recently collected data (covering portions of the property) is more than five years old.

In light of Nuclear Development's plans to complete the two nuclear units, the potential impacts associated with this proposed action, and the current status of environmental data and analyses that exist for this planned use, TVA determined that the potential impacts on the environmental resources listed below should be updated:

- Land Use
- Surface Water
- Groundwater
- Floodplains
- Wetlands
- Aquatic Ecology
- Wildlife
- Vegetation
- Threatened and Endangered Species

- Air Quality
- Climate Change
- Noise
- Hazardous Materials and Solid and Hazardous Waste
- Transportation
- Natural Areas, Parks, and Recreation
- Cultural and Historic Resources
- Seismology
- Radiological Effects
- Health and Safety
- Socioeconomics and Environmental Justice

## 1.5 Necessary Permits or Licenses

Federal and state environmental laws establish standards for radiation exposure in the general environment (areas outside of the NRC-regulated area) and for sources of air pollution, water pollution, and hazardous waste. Environmental permits contain specific conditions governing construction and operation of new or modified emission sources, describe pollution abatement and prevention methods to reduce pollutants, and contain emission limits for the pollutants that would be emitted from the facility. No permits or other approvals are required for TVA to sell the property. Following is a list of the permits and licenses that TVA currently holds for the BLN Property.

**Table 1-1. Permits Currently Held By TVA for the BLN Property**

| Type of Permit/Authorization | Expiration/Termination Date |
|---|---|
| National Pollutant Discharge Elimination System (NPDES) Permit AL0024635 | 04/30/2020 |
| NRC Construction Permit for Unit 1 - CPPR-122 | 10/1/2020 (deferred status) |
| NRC Construction Permit for Unit 2 - CPPR-123 | 10/1/2017 (deferred status) |
| Air Permit for Synthetic Minor Source Operation Permit #705-0021-X004 (two 7,000 kilowatt [kW] diesel generators) | None |
| Resource Conservation Recovery Act (RCRA) EPA Identification No. AL 5640090002 | None |

The following permits or approvals would likely be required for completion of the two nuclear units by Nuclear Development.

- NRC Construction Permit for Unit 1 – CPPR-122
- NRC Construction Permit for Unit 2 – CPPR-123
- Air Permit for Synthetic Minor Source Operation (auxiliary boilers)
- Air Permit for Synthetic Minor Source Operation (diesel generators)
- Title V Air Permit
- Resource Conservation and Recovery Act (RCRA) Hazardous Waste Part A Permit

- NPDES Permit
- Underground storage tank registrations and permits
- Oil Spill Prevention, Control, and Countermeasure Plan or Integrated Pollution Prevention and Spill Response Plan
- Coverage under Alabama General NPDES Permit for Discharges of Stormwater Associated with Construction Activities
- Standard best management practices and Integrated Pollution Prevention Plan for the addition of a stormwater pond if required
- Coordination/consultation with U.S. Fish and Wildlife Service (USFWS)
- U.S. Army Corps of Engineers (USACE) Section 401/404 permit, if wetlands in the project area are filled or dredged
- Notification of Demolition (State of Alabama and EPA if applicable)
- State of Alabama air construction permit (if applicable)
- NRC National Environmental Policy Act [NEPA] reviews supporting a decision to issue permits
- TVA Section 26a permit and/or Land Use Approval

Nuclear Development would be responsible for ensuring necessary permits are obtained and implemented, manifests completed, and hazardous waste disposal properly reported.

For purposes of the analysis in this EA, TVA assumes that Nuclear Development would obtain all required permits and licenses and would comply appropriately with such permits and licenses and all applicable federal, state, and local laws, regulations, and ordinances, respecting its plans for the BLN Property. However, TVA undertakes no duty or obligation with respect to Nuclear Development's plans for the BLN Property or its application for or compliance with any permits, licenses, or applicable laws, regulations, or ordinances, nor does TVA undertake any liability with respect to any failure by Nuclear Development to obtain any necessary permits or licenses or to comply with such permits or licenses or any applicable federal, state, or local laws, regulations, or ordinances.

## 1.6 Public Participation

The Draft EA for the proposed sale of the BLN Property was released for comment on March 31, 2017. The comment period closed on May 1, 2017. In addition to posting on TVA's public NEPA review website, the Draft EA was transmitted to various agencies and organizations for review and comment. A notice of availability requesting comments on the Draft EA was published in newspapers serving the Jackson County, Alabama area. Comments were accepted via TVA's website, mail, and e-mail.

A total of 30 comment letters, emails, and online comments were received from 28 individuals and organizations. Two individuals/organizations provided more than one submission. The comment submissions were carefully reviewed and subdivided into distinct comment statements. A total of 50 comment statements were identified. Similar comment statements were grouped together into 27 comment topics/issues. All letters and emails received during the comment period are included in Appendix B, as are TVA's responses.

# CHAPTER 2 - ALTERNATIVES

This chapter presents descriptions of the proposed action and its alternatives, a brief comparison of their environmental effects, and TVA's preferred alternative.

## 2.1 Description of Alternatives

The following are summaries for each alternative proposed for this EA.

### 2.1.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The majority of the site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. Periodic inspections and critical maintenance would be performed as needed. TVA would maintain the NPDES permit, implement the Integrated Pollution Prevention Plan, and perform environmental monitoring and reporting as required.

Alternative A includes the assessment and remediation of the three firing ranges on the BLN Property. The sampling results at the active range (range 1) indicate that total lead concentration in the soil is below the United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSL) for residential soils. TVA would continue to use the active firing range in accordance with best management practices. Since the sampling results at inactive range 2 indicate that total lead concentration in the soil is below the USEPA RSL for residential soils, no remediation activities are necessary. TVA will post signage notifying that range 2 is closed and no shooting activities should occur at range 2. Two of the eight sampling results collected from inactive range 3 had total lead concentrations above the USEPA RSL for industrial soils. These higher results came from the left upper and lower sections of the berm. However, TVA will remove the entire 225 cubic yards of soil that make up the berm located at range 3. TVA will comply with applicable federal, state, and local requirements for disposing of the soil. TVA will post signage notifying that range 3 is closed and no shooting activities should occur at range 3.

### 2.1.2 Alternative B – Complete the Sale of the BLN Property

Under the proposed action alternative, TVA would complete the sale of the approximately 1,400 acre BLN Property, to the successful bidder Nuclear Development. TVA would retain ownership of the majority of the shoreline around the BLN Property. Figure 1-2 shows the sale tract. The sale includes the two partially constructed at least 1,200-megawatt electric (MWe) Babcock and Wilcox pressurized light water reactors and associated structures and support facilities (cooling towers, intake and discharge structure, ponds, etc.). Additional facilities on the site include 161-kV and 500-kV switchyards and associated transmission lines, office buildings, simulator building, training center, warehouses, three firing ranges, parking lots, railroad spurs (from the BLN Property to the mainline where it passes through Hollywood), roads, laydown areas, and a helicopter landing pad. The approximately 35-acre Pole Yard Training Center would remain TVA property unless Nuclear Development notifies TVA prior to completion of the sale that it elects to

take ownership of this land. Should Nuclear Development elect to assume ownership of the Pole Yard Training Center, TVA would retain a permanent easement for access to and use of the center or any replacement center. The Pole Yard Training Center land is considered part of the sale for the purposes of this EA to ensure the most conservative evaluation of potential impacts.

Based on the expressed intentions of the buyer, for purposes of this EA, TVA assumes that this sale would result in completion and operation of the two partially constructed nuclear reactor units. Nuclear Development currently plans to operate these units as a merchant power plant connected to the power grid through existing transmission lines. The partially completed units are two Babcock and Wilcox 205 pressurized water reactors. When completed and in operation, the nuclear units at the BLN Property are each expected to have at least 1,200 MWe capacity.

Both the 161-kV and 500-kV Bellefonte Switching Stations are included in the sale of the BLN Property. The 500-kV Switching Station is currently de-energized. The 161-kV Switching Station is energized with Bulk Electric System (BES) flow through the station. Therefore, before the completion of the sale, Nuclear Development must register with the North American Electric Reliability Corporation (NERC) or contract with TVA to continue to handle the NERC reporting and operation of the Bellefonte 161-kV Switching Station.

After the completion of the sale, TVA would begin the process of reconfiguring the 161-kV Switching Station to convert the station from a looped substation to a tapped substation, thereby eliminating TVA's responsibility for BES flow and applicable NERC reporting. Nuclear Development would be responsible for reconfiguring the high-side transformer protection to comply with TVA standards and provide adequate protection for the station service transformers. After the completion of the sale, TVA would also begin the process of reconfiguring the TVA fiber optic network to remove any sites from the network that are on the BLN Property and included in the sale. A new fiber optic site would be added at the nearby TVA In-Processing Center to facilitate the reconfiguration. Details of this work are currently being finalized. Should the work entail activities that would impact the BLN Property or surrounding area in ways other than analyzed in this EA, an additional NEPA review would be conducted at that time.

Firing ranges 2 and 3 would be handled by TVA as described in Subsection 2.1.1 prior to the property transfer.

### 2.1.3 Alternatives Considered Earlier by TVA

TVA considered several additional alternatives in connection with its decision to construct and operate a nuclear plant on the site and the decision to restart construction of one of the reactors. TVA also considered non-nuclear energy generation uses for the site. The analyses of these alternative uses can be found in TVA's earlier environmental reviews which are listed in Section 1.3.

## 2.2 Comparison of Alternatives

The environmental impacts of the alternatives are summarized in Table 2-1. These summaries are derived from the information and analyses provided in Chapter 3.

**Table 2-1. Summary and Comparison of Alternatives by Resource Area**

| Resource Area | Alternative A | Alternative B |
|---|---|---|
| Land Use | Minor | Minor |
| Surface Water | None | Minor |
| Groundwater | None | Minor |
| Floodplains | None | Minor |
| Wetlands | None | None |
| Aquatic Ecology | None | Minor |
| Wildlife | None | Minor |
| Vegetation | None | Minor |
| Threatened and Endangered Species (Aquatic Species) | None | Minor |
| Threatened and Endangered Species (Wildlife) | None | Minor |
| Threatened and Endangered Species (Vegetation) | None | None |
| Air Quality | None | Minor and Temporary |
| Climate Change | None | None |
| Noise | None | Minor and Temporary |
| Hazardous Materials, and Solid and Hazardous Waste | Minor | Minor |
| Transportation (Rail and Roadway) | None | Minor and Temporary |
| Natural Areas, Parks, and Recreation | None | Minor and Temporary |
| Cultural and Historic Resources | None | None |
| Seismology | None | None |
| Radiological Effects of Normal Operations | None | Minor |
| Socioeconomics | None | Minor (Beneficial) and Temporary |
| Environmental Justice | None | Minor |

## 2.3 Identification of Mitigation Measures

This EA makes several assumptions about mitigation measures Nuclear Development would implement, in accordance with NRC guidelines and requirements, to complete construction and operation of the nuclear units at the BLN Property. TVA expects that final determination of mitigation measures associated with impacts from construction and operation of the BLN Property would be determined after thorough review of the proposal and further NEPA and other environmental analyses by the NRC with the cooperation of Nuclear Development. TVA is able to make assumptions about the likely mitigation measures based on past TVA experience with NRC licenses and requirements. TVA discusses these assumptions in this EA to inform TVA's

assessment of the impacts of TVA's current proposed action of selling the BLN Property to Nuclear Development. However, except with respect to the mitigation measures specifically noted below as being imposed by TVA, TVA would not be responsible for determining the final mitigation measures or assuring Nuclear Development's compliance with them.

### 2.3.1 Surface Water

TVA expects that Nuclear Development would include precautions in the project design, construction, operation, and maintenance of the site to minimize the potential impacts to surface waters in compliance with state and federal laws. It is assumed that Nuclear Development's construction, operation, and maintenance activities would comply with state construction and runoff permit requirements. Use of best management practices sufficient to avoid adverse impacts could be followed for all construction activities. Best management practices could include:

- Minimizing site grading and soil removal to preserve and protect the environment and receiving waters.
- Staging clearing operations so that only land that would be developed promptly is stripped of vegetation.
- Application of mulch or temporary cover to reduce sheet erosion.
- Installation of permanent vegetation, ground cover, and sod as soon as possible after site preparation.
- Use of sediment basins or other options to control sediment runoff.
- Preservation and integration into the final design of all natural features such as streams, topsoil, trees, and shrubs to the extent possible.
- Use of only EPA-registered herbicides for landscape maintenance.

It is assumed that Nuclear Development would acquire all appropriate permits prior to dredging. It would be a requirement of any 26a permit issued by TVA that dredge material would be disposed of on land lying outside the 100-year floodplain and above the 500-year flood elevation.

It is assumed that all discharges would be regulated by an Alabama state NPDES permit and Nuclear Development would comply with applicable water quality standards and criteria. Water treatment processes would comply with state water quality criteria and applicable NPDES permit conditions to ensure protection of the receiving water body.

### 2.3.2 Floodplains

Development within the few portions of the BLN Property along the shorelines or within the floodplains could require a Section 26a permit or Land Use approval from TVA. If such development is proposed by Nuclear Development, TVA would consider potential loss of flood control storage and other floodplain impacts in determining the conditions for issuing a permit. Any 26a permit issued by TVA would require that any dredged material must be disposed of on land lying outside the 100-year floodplain and above the 500-year flood elevation.

The following commitments would be included in the sale deed (noting that all elevations are referenced to National Geodetic Vertical Datum 1929):

- Portions of the tract proposed for disposal contain floodplain resources; therefore any future activities will be subject to all applicable federal, state, or local floodplain regulations.
- Any future development proposed within the limits of the 100-year floodplain (Elevation 601.7), including fill, will be consistent with the requirements of Executive Order 11988, and any amendments thereto.
- No improvements or fill will be placed within the 100-year floodplain without TVA's prior written approval.
- All future development will be consistent with the requirements of the TVA Flood Control Storage Loss Guideline.
- TVA retains the right to permanently flood this area to elevation 595.44 feet and to temporarily and intermittently flood land in this area lying below elevation 603.4. TVA will not be liable for damages due to flooding.
- Any future facilities or equipment subject to flood damage will be located above or floodproofed to elevation 605.4.

### 2.3.3 Wetlands

The deed would require Nuclear Development to comply with all requirements proscribed by the USACE for impacts to wetlands located on the BLN Property and other applicable laws.

### 2.3.4 Aquatic Ecology

Under Alabama state law, Nuclear Development would be responsible for control of accidental discharge and stormwater runoff through development and implementation of a construction stormwater pollution prevention plan (SWPPP) and a site-specific spill prevention, control, and countermeasure (SPCC) plan, which are implemented prior to construction initiation. If refurbishment of the barge area were needed, construction would be performed in compliance with USACE permits and in consultation with the USFWS regarding impacts to aquatic ecology. It is expected that the intake channel would need to be dredged. It is assumed dredging would be performed in compliance with USACE requirements. It would be Nuclear Development's responsibility to coordinate with the USFWS regarding species surveys in advance of dredging work.

TVA assumes operation of the nuclear units would be in compliance with discharge limits in the NPDES operational permit. Nuclear Development would presumably consider impingement and entrainment in compliance with Section 316(b) of the Clean Water Act and in consultation with the USFWS as applicable.

### 2.3.5 Wildlife

TVA assumes Nuclear Development would adhere to all applicable state and federal laws (including the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act) for actions that may impact wildlife or their habitats. To minimize potential impacts to migratory birds, Nuclear Development's new construction design could follow the USFWS Avian Protection Plan Guidelines and best practice recommendations for reducing bird collisions with buildings where feasible.

### 2.3.6 Vegetation

Nuclear Development would presumably conduct any vegetation clearing and grading in accordance with an SWPPP plan and best management practices designed to minimize impacts. Nuclear Development's state stormwater construction permit would likely require that disturbed areas be revegetated once construction is complete. Additionally, Nuclear Development would be required by the EPA and the Alabama Department of Environmental Management regulations and air permit requirements to control facility and equipment emissions of air pollutants during construction and operation in order to protect ambient air quality which would protect vegetation from related effects.

### 2.3.7 Threatened and Endangered Species

#### 2.3.7.1 Aquatic Ecology – Threatened and Endangered Species

It is expected that accidental discharge and stormwater runoff would be limited under the state-issued SWPPP and a site-specific SPCC plan, which TVA assumes Nuclear Development would implement prior to construction initiation. If refurbishment of the barge area were needed, Nuclear Development would perform construction in compliance with USACE permits and in consultation with the USFWS regarding impacts to aquatic ecology. It is expected that dredging of the intake channel would occur and would be performed in compliance with USACE requirements. Nuclear Development would be required by federal law to coordinate with the USFWS regarding species surveys in advance of dredging work.

It is assumed operation of the nuclear units would be in compliance with discharge limits as outlined in the NPDES permit. Nuclear Development would be required to consider impingement and entrainment in compliance with Section 316(b) of the Clean Water Act and in consultation with the USFWS as applicable.

Nuclear Development would presumably adhere to the parameter and discharge limits of the NPDES permit are imposed by the state of Alabama. The State additionally retains the authority to require Nuclear Development to conduct additional monitoring to ensure that operation of the BLN units would comply with state water quality criteria and applicable NPDES permit conditions to ensure protection of the receiving water body, and TVA assumes that Nuclear Development would conduct any monitoring the State required.

In a letter dated April 15, 2010, in response to TVA's consultation with respect to the 2010 SEIS, the USFWS issued an Endangered Species Act biological opinion (BO) for construction and operation of one unit at the BLN Property. The BO contains an "incidental take" permit that

allows for impacts to the federally listed endangered pink mucket. If either action alternative evaluated in the 2010 SEIS had been implemented, TVA would have provided a total of $30,000 to be used for research and recovery of pink mucket and high priority mollusks within their historic ranges (2010 SEIS Vol. 2, Appendix H). As neither action alternative was pursued, this transaction has not occurred, and TVA is no longer required to commit to this payment. Nuclear Development may be required to apply for a TVA Section 26a permit should site development occur. TVA would review any application and determine if any additional coordination with USFWS is required for issuance of this permit. Additionally, NRC would conduct consultation with the USFWS as part of the environmental review process for any application submitted by Nuclear Development. Impacts and mitigation that Nuclear Development would implement to reduce effects to any federally listed species would be reviewed and reassessed at that time.

#### 2.3.7.2 Terrestrial Ecology – Threatened and Endangered Species

Nuclear Development would presumably adhere to all state and federal laws (including the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act) for actions that may impact state and federally listed species or their habitats.

### 2.3.8 Air Quality

It is assumed Nuclear Development would keep construction equipment properly maintained to minimize vehicle emissions and would use best management practices such as covered loads and wet suppression to minimize emissions of fugitive dust. Nuclear Development would be required by state and federal laws to control emissions from diesel generators and potentially auxiliary boilers to meet all applicable regulatory requirements.

### 2.3.9 Noise

TVA assumes Nuclear Development would comply with all applicable federal, state, and local regulations regarding construction demolition activities which could create significant noise or vibrations.

### 2.3.10 Hazardous Materials and Solid and Hazardous Waste

TVA assumes Nuclear Development would manage construction/demolition wastes in accordance to all relevant federal, state, and local regulations and dispose of such wastes in appropriate, permitted facilities with adequate capacity.

### 2.3.11 Transportation

It is expected that Nuclear Development would analyze impacts of construction and operation workforces on local transportation networks, and meet with local officials to determine appropriate mitigation measures.

### 2.3.12 Cultural and Historic Resources

TVA determined and marked the boundary of Fennell Cemetery. The sale deed will include a covenant enjoining the buyer from conducting any ground-disturbing activities within the marked cemetery.

### 2.3.13 Seismology

It is assumed Nuclear Development would perform design-basis analyses to demonstrate compliance with regulatory requirements with regard to seismic considerations.

### 2.3.14 Radiological Effects of Normal Operations

TVA assumes Nuclear Development would conduct a Radiological Environmental Monitoring Program (REMP) to provide the preoperational and operational monitoring of the BLN Property to protect public health and safety.

### 2.3.15 Socioeconomics and Environmental Justice

It is assumed that Nuclear Development would review the availability of housing prior to the construction phase to assess the need for mitigation.

## 2.4 Preferred Alternative

TVA's preferred alternative is Alternative B, complete the sale of the approximately 1,400 acre BLN Property to Nuclear Development.

# CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental conditions at the BLN Property that might be affected if the No Action or Proposed Action is implemented. This chapter also describes the potential environmental effects that could result from implementation of either of these alternatives based on the information available at the time of this analysis. Full future effects are not reasonably foreseeable at this time as Nuclear Development has not finalized plans for the site. It is assumed the environmental effects associated with completion and operation of the nuclear units at the BLN Property will be analyzed by Nuclear Development and the NRC in the future once plans are finalized.

## 3.1 Land Use

### 3.1.1 Affected Environment

The BLN Property is located on the west bank of the Tennessee River (Guntersville Reservoir) and lies within the Sequatchie Valley. The Sequatchie Valley extends from the Tennessee border nearly one hundred miles southwest into Alabama. In the north, the open, rolling, valley floor, 600 feet in elevation, is nearly 1,000 feet below the top of the Cumberland Plateau and Sand Mountain. South of Blountsville, the topography becomes more hilly and irregular with higher elevations. The Tennessee River flows through the Sequatchie Valley, until it turns west near Guntersville where it leaves the valley. Similar to parts of the Ridge and Valley, this is an agriculturally productive region, with areas of pasture, hay, soybeans, small grain, corn, and tobacco (Griffith et al. 2001).

The BLN Property is located on Guntersville Reservoir in Jackson County near Hollywood, Alabama. The existing BLN Reservation covers approximately 1,600 acres and houses two partially constructed nuclear reactors and supporting infrastructure. A separate training area for TVA's transmission line maintenance and construction personnel is also located onsite. This training area includes classrooms and various outdoor training facilities. Outside of the developed areas, the landscape is largely dominated by extensive areas of fields and forests. The site is bounded on the east by the Tennessee River (Guntersville Reservoir), on the north and west by the Town Creek embayment, and on the south by County Road 588. The approximately 1,600-acre BLN Reservation is currently zoned by TVA as Zone 2 (Project Operations).

The closest town to the BLN Property is Hollywood, Alabama, located immediately west of the site. The town of Hollywood has zoning laws which designate agricultural, residential, or business zones within city limits. Areas outside of incorporated communities in Jackson County, including the BLN Property, do not have zoning laws.

Land use in the immediate vicinity of the BLN Property is a combination of undeveloped, forested, agricultural, and rural residential uses. A solar facility has been proposed but not yet constructed nearby. Commercial and industrial development is concentrated along the U.S.

Highway 72 (US-72) corridor west of the BLN Property. Current land use at the BLN Property is industrial and includes both developed and undeveloped areas as shown on Figure 3.1-1 (Multi-Resolution Land Characteristics Consortium 2011).

### 3.1.2 Environmental Consequences

#### 3.1.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site and the NRC Construction Permit. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. Minor changes in land use would occur with the closure of the two former firing ranges.

#### 3.1.2.2 Alternative B – Complete the Sale of the BLN Property

Land use and land use impacts have been described in previous environmental analyses at the BLN Property. The majority of construction at the site would be expected to occur within already disturbed/industrial use areas. Some construction could occur on other portions of the property resulting in minor changes in land use. Though Nuclear Development has not yet finalized plans for the site, it is assumed no significant changes in land use across most of the BLN Property would occur. Minor changes in land use would occur with the closure of the two former firing ranges.

Alternative B would require a change in designated land use for the portions of land around the reservoir retained by TVA. The retained land would remain allocated as Zone 2 (Project Operations) until TVA updates the Guntersville Reservoir Land Management Plan. At that time, TVA would reassess the condition of the retained land and the backlying property uses and would make changes to the land use allocation to reflect current resources and land uses at the time of the reservoir land plan update.

No known offsite construction would be required that would result in other land use changes or impacts in the vicinity of the BLN Property. Should offsite construction be required, it is anticipated that this would be minor and related to transmission lines and roads similar to descriptions from previous analyses

Therefore, because of the small amount of changes expected to land use both on and offsite, impacts to land use in association with Alternative B are anticipated to be minor and similar to those described in previous analyses such as the 2010 SEIS.

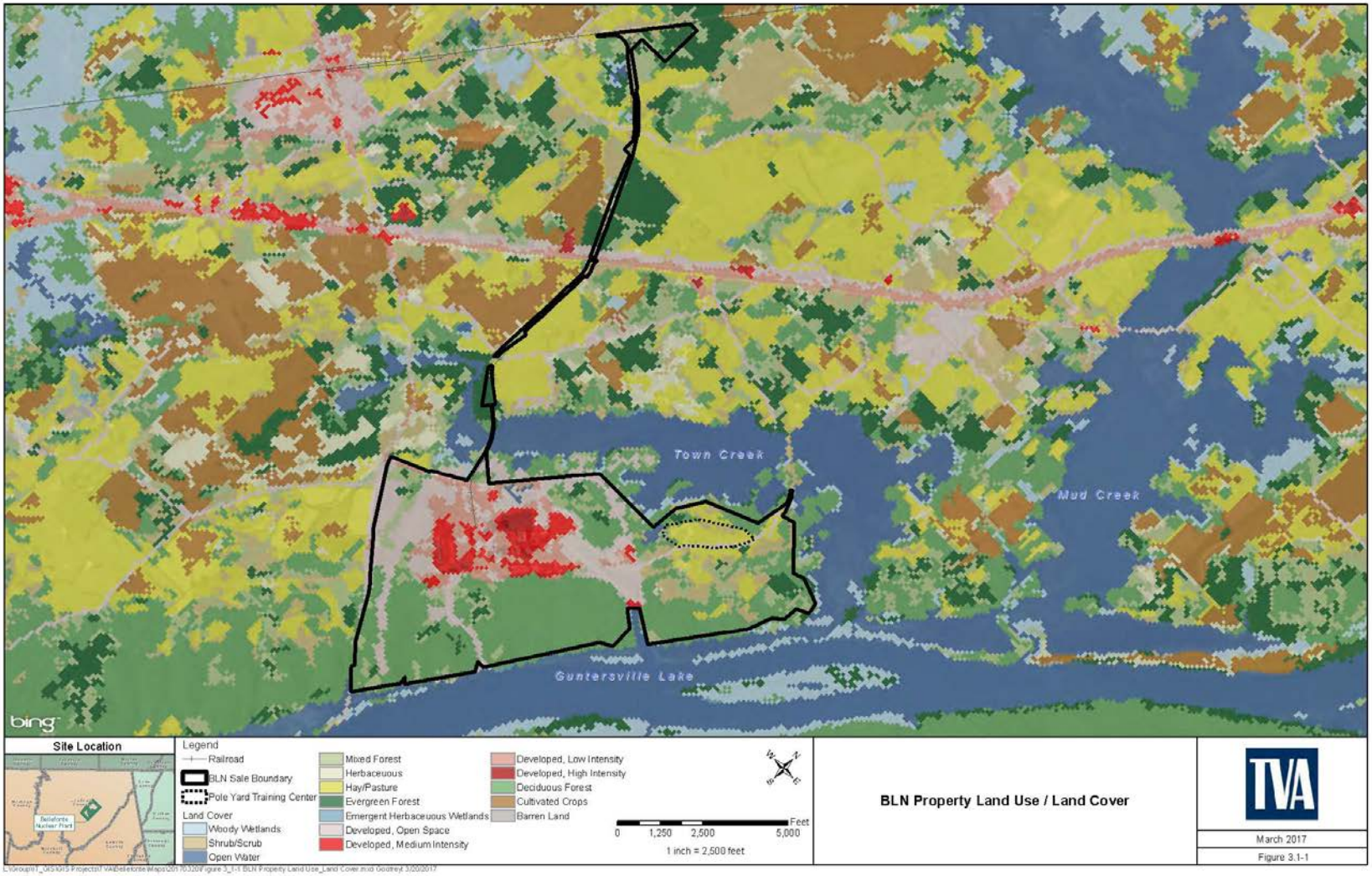


**Figure 3.1-1. BLN Property Land Use**

## 3.2 Surface Water

### 3.2.1 Affected Environment

Guntersville Reservoir extends 76 river miles from Guntersville Dam in northeast Alabama (Tennessee River Mile [TRM] 349.0), across the Alabama–Tennessee state line (TRM 416.5), to Nickajack Dam in southeast Tennessee (TRM 424.7). The Sequatchie River enters Guntersville Reservoir at TRM 422.7, downstream of Nickajack Dam. Guntersville Reservoir has a drainage area of 24,450 square miles, of which 2,589 square miles are not regulated by upstream dams. The reservoir has a shoreline length of 890 miles, a volume of 1,018,000 acre-feet, and a water surface area of 67,900 acres at a normal maximum pool elevation of 595 feet above mean sea level (msl). The width of the reservoir ranges from 900 feet to 2.5 miles.

Guntersville Dam and Reservoir are operated for the purposes of flood protection, navigation, and power production, as well as to protect aquatic resources and provide water supply and recreation. During normal operations, the surface elevation of Guntersville Reservoir varies between 593 feet msl in winter and 595 feet msl in summer. During high-flow periods, the top of the normal operating elevation range may be exceeded to regulate flood flows. From mid-May to mid-September, TVA varies the elevation of Guntersville Reservoir by 1 foot to aid in mosquito population control. Because of the need to maintain a minimum depth for navigation, Guntersville is one of the most stable TVA reservoirs, fluctuating only 2 feet between its normal minimum pool in the winter and its maximum pool in the summer.

The approximately midpoint of the BLN Property is located at TRM 391.5 is located on a peninsula formed by the Town Creek embayment on the right (western) bank of Guntersville Reservoir. A total of 79 watercourses including two perennial streams, eight intermittent stream, two ponds, and 67 ephemeral streams were documented during 2011, 2014, and 2016 surveys along the proposed water and sewer line routes. Streams documented during the 2011 and 2014 field surveys were re-verified during the 2016 field survey. The Town Creek embayment borders the northern and western property boundaries of the BLN Property. Town Creek originates approximately 3 miles southwest of the BLN Property and flows northwestward into Guntersville Reservoir at TRM 393.4. The drainage area of Town Creek at the BLN Property is approximately 6 square miles.

The State of Alabama has designated the reach of the Tennessee River (Guntersville Reservoir) in the vicinity of the BLN Property for public water supply, swimming and other whole-body water-contact sports, and fish and wildlife use classifications. The State of Alabama has designated Town Creek for fish and wildlife use. The State of Alabama has not assigned designated use classifications to the other watercourses at the BLN Property.

The state also assesses the water quality of streams in the state. Those not meeting water quality standards are listed as impaired in the federally mandated 305(b) report (the name refers to Section 305(b) of the Clean Water Act). This report is published in alternate years. The draft 2016 version of the report (Alabama Department of Environmental Management 2016a) lists a section of the Tennessee River (Guntersville Reservoir), in the general vicinity of the BLN Property, beginning about 10 miles upstream from Pump Spring Branch at Stevenson,

Alabama, to the Alabama–Tennessee state line. It also lists two impaired tributary streams to Guntersville Reservoir, neither of which are in the immediate area of the BLN Property: Widows Creek is about 18 miles upstream and Town Creek (a different stream from the one at the BLN Property) is about 30 miles downstream of the BLN Property in Marshall County. All of these stream segments are listed as impaired because of metals (mercury) from atmospheric deposition. (Alabama Department of Environmental Management 2016b)

TVA has conducted the Vital Signs Monitoring Program on Guntersville Reservoir since 1994. The Vital Signs program uses five metrics to evaluate the ecological health of TVA reservoirs: chlorophyll concentration, fish community health, bottom life, sediment contamination, and dissolved oxygen. Values of good, fair, or poor are assigned to each metric. Scores from monitoring sites in the deep area near the dam (forebay, TRM 350), midreservoir (TRM 375.2), and at the upstream end of the reservoir (inflow, TRM 420 and 424) are combined for a summary score. The data from these sites characterize the surface biological and water quality of the reservoir and the BLN Property.

The ecological health condition of Guntersville Reservoir rated good in 2012, the most recent published data (Table 3.2-1). The ratings are based on several indicators from multiple samples at varying depths and locations. Guntersville's ecological health scores have fluctuated within the good range all years except 2008 and 2010, when Guntersville rated fair. The fair ratings were largely because several ecological indicators (dissolved oxygen, chlorophyll, and bottom life) at the forebay concurrently rated at the lower end of their historic ranges, which likely resulted from a dry weather pattern and low flow conditions during most of the summer months. (TVA Vital Signs Monitoring Program 2016)

Ecological health scores tend to be lower in most Tennessee River reservoirs during years with lower flows because chlorophyll concentrations are typically higher and dissolved oxygen levels are lower. In turn, the low dissolved oxygen can negatively affect bottom life.

**Table 3.2-1. Ecological Health Indicators at Guntersville Reservoir — 2012**

| Monitoring location | Dissolved oxygen | Chlorophyll | Fish | Bottom life | Sediment |
|---|---|---|---|---|---|
| Forebay | Fair | Fair | Fair | Fair | Fair |
| Mid-reservoir | Good | Good | Fair | Good | Fair |
| Inflow | Not Available | Not Available | Fair | Good | Not Available |

*Dissolved oxygen*

Dissolved oxygen rated fair at the forebay and good at the mid-reservoir. This indicator has rated good each year at the mid-reservoir. At the forebay, however, low dissolved oxygen concentrations (<2 mg/L) periodically develop in a small area along the reservoir bottom during summer. This resulted in fair ratings some years and a poor rating in 2010.

*Chlorophyll*

Chlorophyll rated fair at the forebay and good at the mid-reservoir. Chlorophyll concentrations were elevated at the forebay during several sample periods. Chlorophyll ratings have fluctuated between good, fair and poor at the forebay, generally in response to reservoir flows. Chlorophyll has rated good at the mid-reservoir each monitoring event except 1994, when it rated fair.

*Fish*

The fish communities rated fair at all locations because the number of individuals and variety of species collected were slightly fewer than expected. Historically, ratings generally have fluctuated within the mid to upper end of the fair range at each location. However, the fish community rated poor (one point from fair) at the inflow in 2000. The inflow's rating rebounded in subsequent years, possibly indicating that the poor rating was an anomaly.

*Bottom life*

Bottom life rated fair at the forebay and good at the mid-reservoir and inflow in 2012. Bottom life typically rates fair or good at all monitoring locations. In 2010, the forebay received the only poor rating for this indicator. This occurred because of reduced diversity and most of the organisms collected were those capable of tolerating poor water quality conditions.

*Sediment*

Sediment quality rated fair at the forebay and mid-reservoir monitoring locations because PCBs were detected in the samples. Sediment quality commonly rates fair at the forebay due to one or more contaminants: PCBs, chlordane or zinc. The sediment rating at the mid-reservoir has fluctuated between good and fair due primarily to chlordane, which was detected in 1996, 2002, and 2004. PCBs were detected at this location in 2002.

*Fish consumption advisories*

TVA maintains a program to examine contaminants in fish fillets from TVA reservoirs and their major tributary streams on a rotational basis. The data collected from this program is distributed to the state officials who are responsible for placing or removing fish tissue consumption advisories on those bodies of water. The fish consumption advisories in the vicinity of the BLN Property are shown in Table 3.2-2. For information on advisories currently in effect for Guntersville Reservoir, visit the Epidemiology Division of Alabama Department of Public Health's Web page at http://www.adph.org/tox/index.asp?ID=1360. (Alabama Department of Public Health 2016)

### 3.2.2 Environmental Consequences

#### 3.2.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site and the NRC Construction Permit and the NPDES permit. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. Therefore, there would be no impacts to surface water.

**Table 3.2-2. Fish consumption advisories in the vicinity of the BLN Property as of 2016**

| Waterbody | Location | Species of Fish | Advisory |
|---|---|---|---|
| Town Creek | Town Creek embayment approximately 4 miles upstream of AL Hwy 227 bridge. (Marshall County) | Largemouth bass | Do Not Eat Any (Mercury) |
| Guntersville Reservoir Dam forebay area | Tennessee River mile 350, downstream of Honeycomb Creek. (Marshall County) | All species | No restriction |
| Guntersville Reservoir | Tennessee River mile 375 between the confluences of South Sauty Creek and Tennessee River and North Sauty Creek and Tennessee River. (Jackson County) | All species | No restriction |
| Guntersville Reservoir | Vicinity of Tennessee River mile 408. Just downstream of Widows Creek. (Jackson County) | Largemouth bass | 2 meals/month (Mercury) |

#### 3.2.2.2 Alternative B – Complete the Sale of the BLN Property

TVA's original 1974 FES was for two units and discussed minor potential surface water impacts. The more recent 2010 SEIS also discussed potential surface water impacts from construction and operation of a single nuclear unit. For details of their analysis, please refer to those documents.

Surface water withdrawal for the each original Babcock and Wilcox unit was estimated to be less than 0.2 percent (0.002) of the flow through Guntersville Reservoir. Discharge was estimated to be approximately two-thirds of the surface water withdrawal rates. Even with two units the withdrawal would be less than 0.4 percent of the flow through Guntersville Reservoir. NPDES permits and compatible final design would also ensure that discharges from the proposed units would not have major negative impacts on surface waters in the vicinity of the BLN Property. Both the 1974 FES and the 2010 SEIS concluded that there potentially could be minor chemical or thermal degradation of surface water quality, changes to hydrology, and consumptive use of surface water. These included:

- Temporary and minor impacts from construction.
- No impacts were anticipated to water supplies from plant water use.
- Near-field and far-field effects to water quality associated with cooling water discharge were not expected to be significant.
- Impacts from chemical discharges were expected to be minor.

These impacts would be similar in nature for completion and operation of two nuclear units as proposed by Nuclear Development should TVA select Alternative B. While two units would have increased quantity, that difference would still only result in minor impacts to surface waters.

Completion of the nuclear units would involve some ground-disturbing construction activities. Soil disturbances associated with such ground-disturbing activities could potentially result in

adverse water quality impacts. Improper water management or storage and handling of potential contaminants could result in polluting discharges or surface runoff to receiving streams. Erosion and sediment could clog small streams and threaten aquatic life. Improper use of herbicides to control vegetation could result in runoff to streams and subsequent aquatic impacts.

TVA assumes Nuclear Development would include precautions in the project design, construction, operation, and maintenance to minimize the potential impacts to surface waters. Construction, operation, and maintenance activities would comply with state construction and runoff permit requirements. Best management practices sufficient to avoid adverse impacts would be followed for all construction activities. Best management practices could include:

- Minimizing site grading and soil removal to preserve and protect the environment and receiving waters.
- Staging clearing operations so that only land that would be developed promptly is stripped of vegetation.
- Application of mulch or temporary cover to reduce sheet erosion.
- Installation of permanent vegetation, ground cover, and sod as soon as possible after site preparation.
- Use of sediment basins or other options to control sediment runoff.
- Preservation and integration into the final design of all natural features such as streams, topsoil, trees, and shrubs to the extent possible.
- Use of only EPA-registered herbicides for landscape maintenance.

Under Alternative B, it is assumed construction activities would incorporate existing facilities and structures and use previously disturbed ground where possible.

It is also assumed that dredging in the intake channel and potentially in the barge dock area would be necessary during construction and periodically during operation of the facility and would result in the removal of dredged material. It is assumed dredged material would be disposed of either onsite or in an approved offsite location above the 500-year flood elevation. During dredging events, temporary increases in turbidity are expected in the immediate vicinity. It is assumed Nuclear Development would acquire all appropriate permits prior to dredging. Therefore, impacts to surface waters would be temporary and minor.

The Tennessee River (Guntersville Reservoir) and the magnitude of its flow provide a source of raw water of sufficient quantity to meet foreseeable needs, including the operation of natural draft cooling towers. No significant long-term water quality impacts are expected.

TVA assumes any chemical treatments would follow guidelines that are in effect at the time of the treatment. The volume of the cooling tower blowdown is anticipated to be small when compared to the river flow. It is also assumed the treatment chemicals added would be largely consumed leaving very small concentrations by the time they are discharged. In addition, TVA assumes all discharges would be regulated by an Alabama state NPDES permit and Nuclear Development would comply with applicable water quality standards and criteria. Water treatment processes would presumably be controlled to comply with state water quality criteria

and applicable NPDES permit conditions to ensure protection of the receiving water body. The standards and criteria applied by the state in establishing NPDES permit limits and requirements are designed to protect public health and water resources, as well as to maintain the designated uses for the receiving water body. Therefore, effects of chemical discharges would be minor.

The 2010 SEIS summarizes the current design of the plant as a closed-cycle cooling system using water drawn from the Guntersville Reservoir and discharging wastewater back to the Reservoir. The plant design, permit details and requirements, and monitoring program are described in Subsection 3.1.3 of the SEIS.

In Subsection 3.1.3 the 2010 SEIS, TVA evaluated the withdrawal of water from and discharge of wastewater to the Guntersville Reservoir to provide cooling water for the operation of one Babcock and Wilcox unit. The proposed operation sought to minimize thermal impacts to Guntersville Reservoir by using a closed-cycle cooling system. The 2010 SEIS analysis concluded that near-field and far-field effects to water quality associated with cooling water discharge were not expected to be significant for operation of a single unit.

Nuclear Development proposes to complete and operate both Babcock and Wilcox reactors at the BLN Property. To consider the impacts of TVA's proposed sale of the BLN Property to Nuclear Development, TVA updated the 2010 SEIS analysis for the operation of two units.

River flows past BLN were computed with an unsteady one dimensional river flow model with inputs for hourly dam releases from Nickajack and Guntersville Dams. A computer model of the BLN cooling system was used to compute blowdown discharge flows and temperatures. The inputs for this model were the minimum and maximum river temperatures from 1975 through 2016, which were not impacted by the operation of the Widows Creek Fossil Plant and hourly measured air temperature and humidity at the nearest airports where complete records were available, Chattanooga, Tennessee, and Huntsville, Alabama.

The results of the above models were used to determine the input data for the CORMIX diffuser model for the following conditions:

1. Maximum differential between blowdown temperature and river temperature with minimum daily average river flow.
2. Minimum 24 hour average river flow with minimum daily average river flow.
3. Maximum river and blowdown temperatures.
4. Maximum temperature differential between river and blowdown with monthly average river flow conditions.
5. Maximum river and blowdown temperatures with monthly average river flow conditions.

Alabama water quality standards prohibit the addition of artificial heat by a discharger that would cause the maximum instream temperature rise above ambient water temperature to exceed $5^{o}$F. At the discharge location the daily maximum limit is $95^{o}$F. All runs assumed two unit operation and discharge through both diffuser legs. None of these conditions indicated any problems with

compliance to the 5°F limit on instream temperature rise (delta T), with the greatest distance downstream from the diffuser at which the temperature exceeded 5 °F being less than 21 feet. TVA is currently completing modeling of conditions with reverse river flow; however, it is not expected that the results will differ significantly from the 2010 study.

Similar to the results reported in the 2010 SEIS, in the current analysis there were some instances of the discharge temperature exceeding the 95°F limit, with the highest discharge temperature computed at 98.7 °F. Most instances this occurred in July (0.115% of total hours in July from 1975 through 2016) with a smaller number occurring in August (0.025%) and June (<0.01%). Exceedances such as these would require reduction of power generation at BLN to stay below the 95°F limit. It should be noted that a cooling tower capability of 80% was used in the discharge temperature calculations based on experience with the original performance (pre-1997 modifications) of the towers at Watts Bar Nuclear Plant, which are of a similar design and vintage. Improvements in tower capability such as has been done at Watts Bar Nuclear Plant would reduce the number of instances of discharge temperature exceeding the 95°F limit.

Overall, hydrothermal impacts to surface waters in conjunction with operation of two nuclear units at the BLN Property would be minor and could be mitigated through compliance with regulatory requirements and potentially through engineering improvements of the cooling towers.

## 3.3 Groundwater

### 3.3.1 Affected Environment

Groundwater conditions at the BLN Property have been documented in several reports over time, beginning with TVA's 1974 FES through the 2010 SEIS. A summary of that groundwater information is provided in the 2010 SEIS. The 2010 SEIS discusses the geologic setting of the BLN Property, the groundwater hydrology underlying the site, groundwater use and trends at the site and in the vicinity, and groundwater quality at the site as determined through monitoring.

As described in the 2010 SEIS, there are no groundwater supply wells onsite at the BLN Property. Groundwater is not used as a municipal or industrial water source within a 2-mile radius of the BLN Property. Groundwater quality at the BLN Property has been monitored over years to obtain background concentrations, examine the effect of onsite disposal practices, and in response to specific incidents. Monitored parameters included radionuclides, organics, and inorganics. Monitoring through 1990 of the effects of trisodium phosphate waste/wastewater disposal onsite in the early to mid-1980s indicated that the associated metals and phosphorous concentrations had returned to background or near background levels. The same was true for sodium, except at one well which continued to show elevated concentrations. Monitoring in response to diesel spills onsite in the 1980s and early 1990s indicated that by 2004, the levels of critical contaminants had decreased to regulatory acceptable values. Other monitoring at the site was primarily to collect background levels for comparison and evaluation purposes (TVA 2010).

No new information is available about geology or groundwater at the BLN Property.

### 3.3.2 Environmental Consequences

#### 3.3.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site and the NRC Construction Permit. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. There is currently no groundwater use on site and this would continue. As conditions would be unchanged from present, there would be no adverse impact to groundwater, including groundwater hydrology, use, and quality.

#### 3.3.2.2 Alternative B – Complete the Sale of the BLN Property

Though Nuclear Development has not finalized plans for the site, since both nuclear units have been constructed, ground disturbance and excavation is anticipated to be minor in scope. Additionally, the current BLN plant design does not call for operational use of groundwater. Therefore, impacts to groundwater associated with completion of the sale of the BLN Property would be anticipated to be minor.

The 2010 SEIS examined the impacts to groundwater associated with the completion and operation of a single nuclear unit and the 2008 COLA ER examined the potential impacts to groundwater associated with the operation of two nuclear units at the BLN Property. The 2010 SEIS and the 2008 COLA ER concluded that the completion and operation of one or two nuclear units at the BLN Property would not be anticipated to impact groundwater hydrology or groundwater use either onsite or locally. Nonradiological impacts to groundwater quality associated with completion and operation would be minor.

TVA assumes Nuclear Development would complete and operate the nuclear units in accordance with all applicable permits and regulations and with implementation of best management practices. Nuclear Development's SPCC would presumably minimize and mitigate the potential for spills of oil or hazardous materials and keep these materials out of the groundwater.

As described in the 2010 SEIS, instances of nuclear plants inadvertently releasing tritium contamination to groundwater have been documented in the past. Impacts associated with operation of the nuclear units at the BLN Property would be anticipated to be minor with implementation of permit requirements and monitoring and mitigation programs. The permit requirements and monitoring program would be determined during Nuclear Development's planning and permitting process in coordination with the NRC.

## 3.4 Floodplains and Flood Risk

### 3.4.1 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 100-

year floodplain to ensure that the project is consistent with the requirements of Executive Order (EO) 11988. The proposed disposal of the BLN Property would involve the floodplains of Town Creek and the Tennessee River (Guntersville Reservoir) in Jackson County, Alabama. Floodplains associated with the project area are shown in Figure 3.4-1.

The proposed property disposal would involve land located adjacent to Town Creek from the mouth up to Mile 4.5, and land located adjacent to the Tennessee River (Guntersville Reservoir) between TRM 390.4 and 393.6, right descending bank. The 100-year flood elevations and TVA Flood Risk Profile elevations vary in this reach of the Tennessee River (Guntersville Reservoir). The river miles and corresponding flood elevations are provided in Table 3.4-1.

**Table 3.4-1. Stream Miles and Flood Elevations at the BLN Property**

| Stream Name | River Miles | 100-year flood elevation, in feet, msl | Flood elevation, in feet, msl[1] | Elevation Type |
|---|---|---|---|---|
| Town Creek | 0.0-4.5 | 601.4-601.7 | 603.1-603.3 | 500-year |
| Tennessee River | 390.4-393.6 | 600.5-601.4 | 601.8-603.1 | TVA Flood Risk Profile[1] |

1. The TVA Flood Risk Profile elevation is equal to the 500-year flood elevation.

### 3.4.2 Environmental Consequences

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "…to avoid to the extent possible the long- and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (EO 11988, Floodplain Management). 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. It is necessary to evaluate development in the 100-year floodplain to ensure that the project is consistent with the requirements of EO 11988

#### 3.4.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. Therefore, there would be no impacts to floodplains because there would be no physical changes to the current conditions found within the floodplains. This would be consistent with EO 11988.

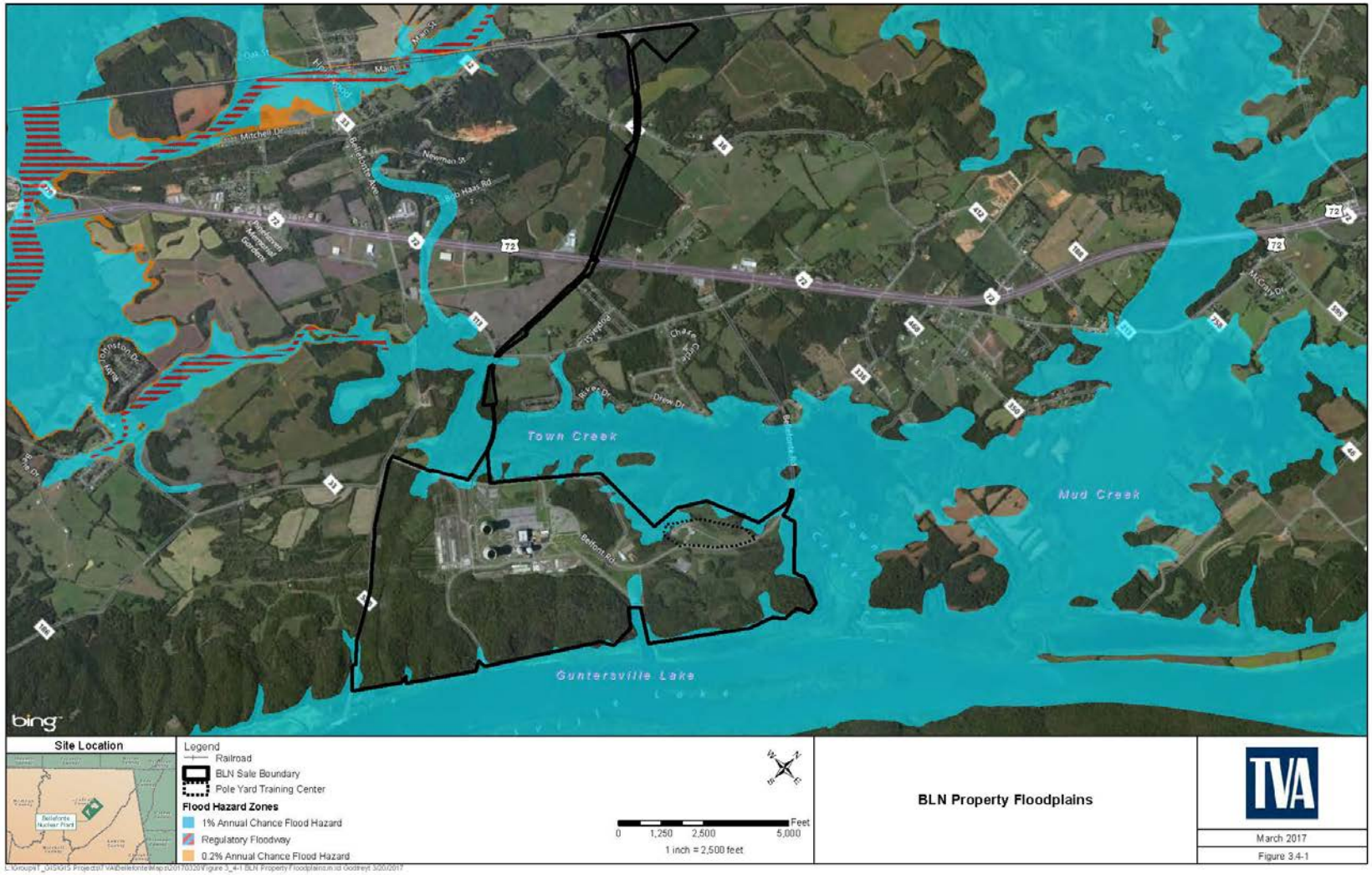


**Figure 3-4-1. Floodplains associated with the BLN Property (Federal Emergency Management Agency 2016)**

#### 3.4.2.2 Alternative B – Complete the Sale of the BLN Property

TVA assumes only minor additional physical disturbance of the site from new construction would occur, as Nuclear Development has expressed the intent to complete the existing nuclear units. The majority of the property involved in the sale is located above the TVA Flood Risk Profile with the exception of the area around the intake channel and discharge location.

It is expected that dredging would occur in the intake channel. However, consistent with EO 11988, dredging is a repetitive action that would result in minor impacts provided that the dredged material would be disposed of on land lying outside the 100-year floodplain and above the TVA Flood Risk Profile flood elevation.

The existing safety-related structures (defined by NRC as systems, structures, and components of a nuclear plant that are relied upon to remain functional during and following design-basis events) are either located outside the 100-year floodplain and above the TVA Flood Risk Profile elevation or are flood-proofed as appropriate; therefore, the existing structures would be consistent with EO 11988.

Completion and operation of the nuclear units would not increase the flood risk in the Guntersville Reservoir watershed because this activity would not impact upstream flood elevations.

TVA would retain the fee land below approximately elevation 602; therefore, almost all of the disposed property would be above not only the 100-year flood elevation, but the TVA Flood Risk Profile elevation also. As mentioned above, a small portion of the proposed disposal contains floodplains and floodplain resources. This portion of land would be subject to all applicable federal, state, or local floodplain regulations and ordinances.

Development within the few portions of the BLN Property along the shorelines or within the floodplains could require a Section 26a permit or Land Use approval from TVA. If such development is proposed by Nuclear Development, TVA would consider potential loss of flood control storage and other floodplain impacts. Any 26a permit issued by TVA would require that any dredged material must be disposed of on land lying outside the 100-year floodplain and above the 500-year flood elevation.

Disposal of the BLN Property and completion and operation of nuclear power facilities would have no substantial impact on floodplains. The following commitments would be included in the sale deed, noting that all elevations are referenced to National Geodetic Vertical Datum 1929:

- Portions of the tract proposed for disposal contain floodplain resources; therefore any future activities will be subject to all applicable federal, state, or local floodplain regulations.
- Any future development proposed within the limits of the 100-year floodplain (Elevation 601.7), including fill, will be consistent with the requirements of Executive Order 11988, and any amendments thereto.

- No improvements or fill will be placed within the 100-year floodplain without TVA's prior written approval.
- All future development will be consistent with the requirements of the TVA Flood Control Storage Loss Guideline.
- TVA retains the right to permanently flood to elevation 595.44 and to temporarily and intermittently flood land in this area lying below elevation 603.4. TVA will not be liable for damages due to flooding.
- Any future facilities or equipment subject to flood damage will be located above or floodproofed to elevation 605.4.

## 3.5 Wetlands

### 3.5.1 Affected Environment

Wetlands are those areas inundated by surface or groundwater such that vegetation adapted to saturated soil conditions are prevalent. Examples include swamps, marshes, bogs, and wet meadows. Wetland fringe areas also are found along the edges of most watercourses and impounded waters (both natural and man-made). Field surveys were conducted August 1–5, 2016 to delineate wetland areas in portions of the BLN Property that had not been surveyed previously for wetlands.

The wetland assessments in August 2016 were performed according to the USACE standards, which require documentation of hydrophytic (wet-site) vegetation, hydric soil, and wetland hydrology (Environmental Laboratory 1987; Lichvar et al. 2016; USACE 2012). Broader definitions of wetlands, such as that used by the United States Fish and Wildlife Service (Cowardin et al. 1979) and in the TVA Environmental Review Procedures (TVA 1983), were also considered in this review. A TVA-developed modification of the Ohio Rapid Assessment Method (Mack 2001) specific to the TVA region (TVA Rapid Assessment Method or "TVARAM") was used to categorize wetlands by their functions, sensitivity to disturbance, rarity, and ability to be replaced.

TVARAM scores are used to classify wetlands into three categories. Category 1 wetlands are considered "limited quality waters." They represent degraded aquatic resources having limited potential for restoration with such low functionality that lower standards for avoidance, minimization, and mitigation can be applied. Category 2 includes wetlands of moderate quality and wetlands that are degraded but have reasonable potential for restoration. Avoidance and minimization are the preferred mitigation measures for Category 2 wetlands. Category 3 generally includes wetlands of very high quality or of regional/statewide concern, such as wetlands that provide habitat for threatened or endangered species. Complete avoidance is the preferred mitigation measure for Category 3 wetlands.

Previous assessments in 2009 and 2011 identified wetlands and other natural resources associated with the areas around the nuclear plant and associated infrastructure. These surveys covered approximately half of the site. In August 2016, TVA completed another wetland survey that focused on identifying and delineating wetlands outside of the previously surveyed areas.

Fifteen wetland areas, totaling 25.46 acres, were identified within the approximately 1,600 acre BLN Reservation as shown in Figure 3.5-1 and described in Table 3.5-1. As shown in Table 3.5-1, seven of these wetlands (for a total of 8.45 acres) are located entirely within the approximately 1,400 acre BLN Property considered for the sale. One wetland (W06, 1.57 acres) overlaps both the BLN Property and TVA retained land with the majority on TVA land. The other six wetlands (15.44 acres) are located on TVA retained land surrounding the site. Brief descriptions of each wetland follows.

**Table 3.5-1. Wetlands Identified on the BLN Reservation, August 1-5, 2016**

| Wetland Identifier | Type[1] | TVARAM Existing Functional Capacity (Category, score) | Wetland Acreage | Located within the BLN Property Sale Boundary |
|---|---|---|---|---|
| W01 | PFO1E | Superior (3, 60) | 0.16 | Yes |
| W02 | PFO1E | Moderate (2, 52) | 0.09 | Yes |
| W03 | PFO1E | Moderate (2, 51) | 0.20 | No (on TVA land) |
| W04 | PFO1E | Moderate (2, 49) | 1.48 | Yes |
| W05 | PFO1E | Moderate (2, 48) | 0.74 | No (on TVA land) |
| W06 | PFO1E | Superior (3, 60) | 1.57 | Yes and No (overlaps sale boundary) |
| W07 | PEM1F/PFO1E | Moderate (2, 56.5) | 2.45 | No (on TVA land) |
| W08 | PEM1E/PFO1E | Moderate (2, 41.5) | 0.38 | Yes |
| W09 | PFO1E | Moderate (2, 41.5) | 0.72 | Yes |
| W10 | PEM1E/PSS1E/PFO1E | Moderate (2, 41.5) | 4.91 | Yes |
| W11 | PFO1E | Moderate (2, 44) | 0.71 | Yes |
| W12/W13 | PFO1E | Moderate (2, 51.5) | 4.51 | No (on TVA land) |
| W14 | PFO1E | Moderate (2, 43) | 0.77 | No (on TVA land) |
| W15 | PABH/PUBH | Moderate (2, 40.5) | 6.77 | No (on TVA land) |
| | | **Total Wetland Acres** | **25.46** | |

[1]Classification codes as defined in Cowardin et al. (1979):
E = Seasonally flooded/saturated
F = Semi-permanently flooded
H = Permanently flooded
PAB1 = Palustrine aquatic bed, persistent vegetation
PEM1 = Palustrine emergent, persistent vegetation
PFO1=Palustrine forested, broadleaf deciduous vegetation
PSS1=Palustrine, scrub-shrub, broadleaf deciduous vegetation
PUB = Palustrine unconsolidated bottom.

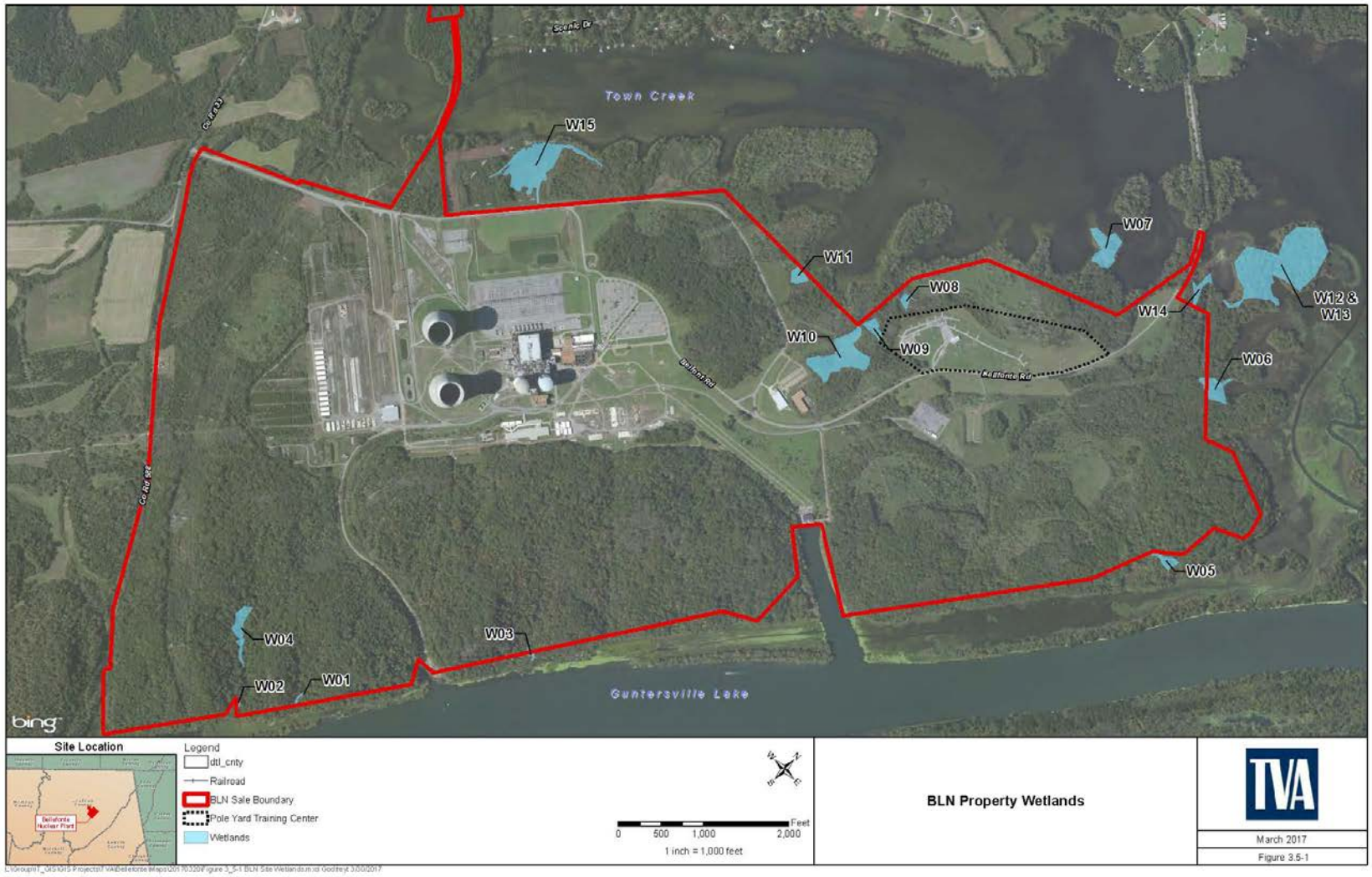


**Figure 3.5-1. Wetlands within the BLN Property Disposal area**

Wetland 1 (W01) is part of a narrow wetland drain with 0.16 acre of bottomland hardwood habitat. This wetland drainage system is associated with an unnamed tributary to the Tennessee River (Guntersville) Reservoir downstream of the TVA barge loading area. W01 had small areas of standing water up to a 1-inch depth with saturated hydric soils exhibiting redoximorphic features throughout the soil profile. W01 was dominated with hydrophytic vegetation. These species included water tupelo (*Nyssa aquatica*), American hornbeam (*Carpinus caroliniana*), sweet gum (*Liquidambar styraciflua*), pawpaw (*Asimina triloba*), spice bush (*Lindera benzoin*), lizard's tail (*Saururus cernuus*), Nepalese browntop (*Microstegium vimineum*), roundleaf greenbrier (*Smilax rotundifolia*), and climbing hydrangea (*Decumaria barbara*).

Wetland 2 (W02) is located along a small unnamed tributary to the Tennessee River (Guntersville Reservoir) downstream of the TVA barge loading area. W02 had small areas of standing water up to a 1-inch depth with saturated hydric soils exhibiting redoximorphic features from 3 to 12 inches below ground surface. The wetland includes 0.09 acre of forested wetland habitat. W02 was dominated with hydrophytic vegetation including water tupelo, American hornbeam, Virginia sweet spire (*Itea virginica*), spice bush, lizard's tail, marsh dayflower (*Murdannia keisak),* broadleaf cattail (*Typha latifolia*), and roundleaf greenbrier.

Wetland 3 (W03) is a forested wetland in a flatwoods area of a small unnamed tributary to the Tennessee River (Guntersville Reservoir) upstream of the TVA barge loading area. W03 is approximately 0.20 acre and exhibits a hydrology of ponded surface water with a high water table. Saturated soils were hydric and exhibited redoximorphic features extending throughout the soil profile. This wetland was dominated by American hornbeam, sycamore (*Platanus occidentalis*), spice bush, red cedar (*Juniperus virginiana*), lizard's tail, Nepalese browntop, rattan vine (*Berchemia scandens*), and roundleaf greenbrier.

Wetland 4 (W04) is a moderately large, forested wetland in a flatwoods area near the headwaters of a tributary to the Tennessee River (Guntersville Reservoir). W04 is connected to W02 by an intermittent stream. W04 is approximately 1.48 acres and is located upstream of W02. W04 exhibited inundation with surface water and a high water table. Hydric soils were not present, but given the overwhelming wetland hydrology and hydrophytic vegetation evidence, this area might be considered problematic. The reddish hue of the soils indicate that recently eroded material has potentially accumulated along the flatwoods area. Vegetation was dominated by red maple (*Acer rubrum*), American hornbeam, spice bush, Canada clearweed (*Pilea pumila*), lizard's tail, and climbing hydrangea.

Wetland 5 (W05) is a forested wetland in a flatwoods area located near the northeastern corner of the site. W05 is approximately 0.74 acre and contributes to the Tennessee River (Guntersville Reservoir). Hydrology indicators included surface water up to 5 inches deep and several secondary indicators. Hydric soils with redoximorphic features were located at 3 to 12 inches below ground surface. This wetland area was dominated by hydrophytic vegetation including red maple, overcup oak (*Quercus lyrata*), silver maple (*Acer saccharinum*), hazel alder (*Alnus serrulata*), possum haw (*Ilex decidua),* lizard's tail, rice cut grass (*Leersia oryzoides*), rattan vine, and roundleaf greenbrier.

Wetland 6 (W06) is a forested wetland that also contains a shoreline fringe of the Town Creek embayment, which is part of Guntersville Reservoir. It comprises 1.57 acres and drains to the Tennessee River. W06 exhibited inundated and saturated soils with a water table at 8 inches below the ground surface. The dominant soil matrix exhibited redoximorphic features extending to the soil surface. The dominant vegetation within the wetland consisted of willow oak (*Quercus phellos*), green ash (*Fraxinus pennsylvanica*), stiff dogwood (*Cornus foemina*), American hornbeam, lizard's-tail, rice cut grass, marsh dayflower, poison ivy (*Toxicodendron radicans*), and dodder vine (*Cuscuta sp*.).

Wetland 7 (W07) is an emergent/forested wetland associated with shoreline fringe and an island in the Town Creek embayment on Guntersville Reservoir. This wetland covers approximately 2.45 acres. W07 exhibited inundated and saturated soils with a water table at 8 inches below the ground surface. W07 had hydric soil with a depleted matrix and redoximorphic features nearly extending to the soil surface. Dominant vegetation included red maple, red elm (*Ulmus rubra*), buttonbush (*Cephalanthus occidentalis*), broadleaf cattail, and swamp smartweed (*Persicaria hydropiperoides*).

Wetland 8 (W08) is part of a wetland complex in a large constructed basin that includes W08, W09, and W10. The basin receives surface and storm water runoff from TVA's Training and Simulator Buildings and a field training area. W08 appears to drain into W09 which drains into W10 and eventually into the Town Creek embayment on Guntersville Reservoir. W08 contains a mix of emergent and forested wetland habitat covering a total of 0.38 acre. W08 exhibited a mix of one primary and two secondary hydrologic indicators. W08 would be considered a potential problem area since soils did not exhibit hydric soil morphology; however, soil morphology indicates that some redoximorphic features have begun to develop. The wetland was dominated by hydrophytic plant species including black willow, persimmon (*Diospyros virginiana*), sweetgum, dock-leaf smartweed (*Persicaria lapathifolia*), and red-top cut-throat grass (*Coleataenia rigidula*).

Wetland 9 (W09) is part of the same wetland complex and constructed basin as W08 and W10. W09 appears to receive drainage from W08, and drains into W10, which eventually discharges into the Town Creek embayment on Guntersville Reservoir. W09 contains a mix of emergent and forested wetland habitat covering a total of 0.72 acre. W09 exhibited one primary and two secondary hydrologic indicators. W09 would be considered a potential problem area since soils did not exhibit hydric soil morphology; however, soil morphology indicates that some redoximorphic features have begun to develop. The wetland was dominated by hydrophytic plant species including green ash, black willow, sweetgum, dock-leaf smartweed, and peppervine (*Ampelopsis arborea*).

Wetland 10 (W10) is a wetland complex consisting of a mix of emergent, scrub-shrub, and forested wetland habitat. The wetland is part of the same wetland system and constructed basin as W08 and W09. W10 receives drainage from W08 and W09, eventually draining into the Town Creek embayment on Guntersville Reservoir. W010 covers 4.91 acres. W10 exhibited several primary and secondary wetland hydrology indicators. Soils were inundated and saturated with a depleted matrix nearly extending to the soil surface. The wetland was dominated by hydrophytic

emergent, scrub-shrub/sapling, and tree species including red maple, black willow, stiff dogwood, lizard's-tail, dock-leaf smartweed, false nettle, rattan vine, and peppervine.

Wetland 11 (W11) comprises 0.71 acre of forested wetland along the shoreline of the Town Creek embayment of Guntersville Reservoir. Soils exhibited two primary and one secondary wetland hydrology indicators. Soils were saturated with a depleted matrix and redox features that extended almost to the soil surface. W11 was dominated by hydrophytic vegetation including green ash, red maple, red elm, lizard's-tail, poison ivy, rattan vine, and cross vine (*Bignonia capreolata*).

Wetland 12 (W12) and Wetland 13 (W13) are wetlands located along the neck of a large peninsula that extends into the Town Creek embayment near the north end of the BLN Property. Severe storms that hit the area in the spring of 2014 uprooted many large trees in the area making the peninsula inaccessible. Data were collected along the shoreline on the eastern and western shoreline at the southern end of the peninsula. Based on field data, site conditions, and aerial photographs, it is estimated that roughly one-third (4.51 acres) of the peninsula is wetland habitat and the remaining 9.02 acres is upland habitat. The wetland exhibited strong, secondary hydrology indicators and hydric soils with a depleted matrix and redox features extending nearly to the surface. Dominant hydrophytic vegetation included green ash, red elm, persimmon, woolgrass, Virginia cut grass, and roundleaf greenbrier.

Wetland 14 (W14) is a forested wetland in a drainage slough that leads to the Town Creek embayment on Guntersville Reservoir. W14 totals 0.77 acre and was affected by extensive large tree blowdown from the same storms that affected W12/W13 in 2014. This wetland contained a mix of primary and secondary hydrology indicators during the site visit. In addition, soils contained a depleted matrix and redox features extending to the surface. Dominant hydrophytic wetland species included green ash, sweetgum, possum haw, woolgrass, broadleaf cattail, rice cut grass, lizard's tail, and rattan vine.

Wetland 15 (W15) is the Construction Holding Pond at the BLN Property. The pond covers 6.77 acres and includes a mix of aquatic bed and unconsolidated bottom wetland habitat. The water from the pond drains into the Town Creek embayment on Guntersville Reservoir through Outfall DSN0021. The pond is at least a few feet deep and is largely free of regular wetland plants. Dominant vegetation within the pond includes a mix of submerged aquatic plants such as American lotus (*Nelumbo lutea*), hydrilla (*Hydrilla verticillata*), and Eurasian watermilfoil (*Myriophyllum spicatum*). Other vegetation around the pond margins include buttonbush, hazel alder, lizard's tail, woolgrass, and squarestem spikerush (*Eleocharis quadrangulata*).

### 3.5.2 Environmental Consequences

#### 3.5.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site and the NRC Construction Permit. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. There would be no impacts to wetlands.

#### 3.5.2.2 Alternative B – Complete the Sale of the BLN Property

The majority of construction would occur within the existing structures and disturbed areas, but some additional ground-disturbing activities would occur. The seven wetlands located outside of the sale boundary would not be affected by future Nuclear Development activities.

As Nuclear Development has not finalized plans for the site, the extent of wetland impacts and necessary mitigation is unknown at this time. Nuclear Development would be responsible for complying with all requirements proscribed by the USACE for impacts to wetlands located on the property and other applicable laws.

During operation, the impact of the thermal plume on emergent, floating-leaved, and submerged vegetation that composes much of the shoreline wetlands would be minimal due to the small temperature change predicted in Section 3.2.2.2.

Some localized enhancement of macrophyte growth could occur along portions of the mainstream east bank and the adjacent shallow area (U.S. Department of Energy 1999). With permit compliance and application of best management practices, no indirect effects to wetlands are anticipated from runoff or sedimentation during construction or initial or long-term operations at the BLN Property.

The 2008 COLA ER for construction and operation of two AP1000 units, using the existing cooling towers at the site, predicted the salt deposition rate to be too low to cause damage to wetlands in the vicinity of the BLN Property. As part of the NRC permitting and NEPA evaluation process once plans are finalized, it is expected Nuclear Development would analyze the salt deposition rate for the completion of the two nuclear units on the BLN Site. It is anticipated that deposition of salts would remain low and impacts to wetlands in the area would be, at most, minor with compliance with all applicable regulations and standards and use of best management practices.

TVA assumes Nuclear Development would adhere to USACE regulations and permit requirements for actions that may impact wetlands. It is also expected Nuclear Development would cooperate in future NEPA analyses to further analyze impacts to wetlands in conjunction with the NRC review and permitting process.

## 3.6 Aquatic Ecology

### 3.6.1 Affected Environment

The BLN Property is located on a peninsula on Guntersville Reservoir in Jackson County near Hollywood, Alabama. A total of 79 watercourses including two perennial streams, eight intermittent stream, two ponds, and 67 ephemeral streams were documented during 2011, 2014, and 2016 site visits. Streams documented during the 2011 and 2014 field surveys were re-verified in 2016. No fish, mussels, or aquatic snails were observed in 2016, though a formal collection survey was not conducted at this time.

### 3.6.2 Environmental Consequences

#### 3.6.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. There would be no impacts to aquatic ecology.

#### 3.6.2.2 Alternative B – Complete the Sale of the BLN Property

The majority of new construction is expected to occur within existing structures and previously disturbed areas. Because intake and discharge structures are already in place, new construction is not expected to occur near the banks of the reservoir. Additionally, accidental discharge and stormwater runoff would be limited under the construction SWPPP and site-specific SPCC plan, which would be implemented under Alabama state law prior to construction initiation. If refurbishment of the barge unloading dock and or intake and discharge structures were needed, it would be performed in compliance with USACE requirements and, as appropriate, coordinating with the USFWS regarding impacts to sensitive aquatic species.

Should the intake channel require dredging, it would be performed in compliance with USACE requirements. It is expected that Nuclear Development would coordinate with the USFWS regarding species surveys in advance of dredging work. Pre-dredge conditions should return as benthic communities recolonize the area and suspended solids settle out of the water column. Therefore, dredging would only be expected to have minor and temporary direct and indirect effects on aquatic communities.

Operational impacts on aquatic communities could occur through the release of thermal, chemical, or radioactive discharges to the atmosphere or river. Operation of the nuclear units would be in compliance with discharge limits as outlined in the NPDES operational permit and with NRC established limits. Thermal effects on the aquatic communities in the vicinity are anticipated to be minimal due to the relatively small amount of heat involved. In 1985, Browns Ferry Nuclear Plant on Wheeler Reservoir, which is immediately downstream of Guntersville Reservoir on the Tennessee River, initiated a three-phase biological monitoring program to evaluate the effects of the Browns Ferry Nuclear Plant thermal discharge on total standing stocks and selected fish species in Wheeler Reservoir. The results were reported to the state of Alabama in 1998 (Baxter and Buchanan 1998), and additional analyses of the data were provided as part of the NPDES permit renewal application submitted in September 1999 (TVA 1999). Both the final report and the additional analyses concluded that the operation of Browns Ferry Nuclear Plant in accordance with the current permit limitations has not had a significant impact on the aquatic community of Wheeler Reservoir or on the specific aquatic species studied. Similar results could be expected from the operation of the BLN Property by Nuclear Development under NPDES permit limitations. Only minor effects on benthic organisms are anticipated. Because the plume would likely not affect the entire cross-section of the river, there would be adequate room for fish passage around the affected area.

Potential chemical or radioactive releases from nuclear plant operation could affect aquatic species near the site and in the reservoir downstream of the site, either directly or indirectly through the food chain. However, any potential uptake of excessive toxins would be incidental and localized, resulting in minimal impacts to aquatic life (AEC 1974, TVA 1991, U.S. Department of Energy 1999). No adverse direct or indirect effects on aquatic communities are expected to result from normal plant releases (i.e. thermal, chemical, and radiological releases), and therefore impacts on aquatic life from chemical or radiological releases would be minor.

Impingement and entrainment associated with operating plant intake structures have potential to affect aquatic organisms. Impingement occurs when aquatic organisms too large to pass through the screens of a water intake structure become pinned against screens and are unable to escape. Entrainment is the involuntary capture and inclusion of organisms in streams of flowing water, such as plant cooling water systems. Impingement and entrainment are regulated under Section 316(b) of the Clean Water Act. The effects of plant operation are unique to the aquatic community conditions and the physical characteristics of the withdrawal at each facility. However, impingement and entrainment monitoring can only occur when a plant becomes operational. Nuclear Development's plans for operation of the intake structure are not yet known. It is expected that Nuclear Development would consider impingement and entrainment in compliance with Section 316(b) of the Clean Water Act, USACE requirements, and the USFWS as applicable. Operation of the nuclear units would result in some impingement and entrainment of fish. However, with permit and regulatory compliance during operations, these effects would be minor, and would not result in direct or indirect adverse effects on fish communities in the Guntersville Reservoir.

## 3.7 Wildlife

### 3.7.1 Affected Environment

Assessments for wildlife habitat of the proposed sale area of the BLN Property were conducted in August 2016. The August 2016 surveys reviewed areas previously surveyed in 2011 and included new areas that had not been surveyed before. The proposed sale area encompasses the developed nuclear plant infrastructure as well as forested and cleared areas. The nuclear facility and disturbed areas immediately adjacent to the facilities include parking areas, buildings, cooling towers, roads, forest fragments, maintained grassy areas and landscaping. Upland forest fragments along Bellefonte Road are disturbed mixed deciduous forests and young secondary growth forest. Wildlife habitat along Guntersville Reservoir is comprised of topographically variable areas of upland, mixed, deciduous forests and wetland embayments along the shoreline. Several moss covered, rock outcrops occur on the south-facing slopes along the reservoir. These rock outcrops are typically found within mature oak-hickory forests with little recent disturbance. Areas north of the intake and away from along Guntersville Reservoir have been heavily disturbed in sections due to several landfills and a cemetery. Wetlands along the reservoir shoreline and inland along Town Creek provide additional wildlife habitat for riparian associated species. Transmission line rights-of-ways (ROWs) with early successional herbaceous vegetation cut through several forest types on the southwestern end of the BLN Property connecting to a substation within the plant property. A railroad ROW surrounded by secondary forest growth is also included in the BLN Property.

Descriptions of low quality edge habitat, transmission line and railroad ROW habitat, and forested habitat for wildlife near the developed facility are discussed in a previous TVA FEA (TVA 2014). Highly modified habitats, upland forest, and riparian habitats near the plant facility are also discussed in the 2010 SEIS (TVA 2010). This review is focused on forested areas along the Guntersville Reservoir not discussed in previous environmental documents.

Forested habitat along Guntersville Reservoir lies on undulating hillsides and topographically variable terrains. This mixed deciduous forest is mostly mature oak–hickory forest with little disturbance in upland areas. South-facing slopes are often steep and several have rock outcrops. The open understory, thin midstory and closed canopy of these forested areas make them suitable for many terrestrial animal communities. Such forest structure is ideal for bat navigation and foraging through the forest. It is likely that a variety of bat species utilize this forest including big brown bat, eastern red bat, evening bat, and silver-haired bat. Hollow snags and trees with exfoliating bark provide suitable roosting habitat for several of these more common bat species (Harvey et al. 2011). This forest structure is also ideal for several bird species including those neotropical migrants that prefer mature forests with open understories. Birds that use these areas for nesting, foraging, or migratory stop-over grounds may include Acadian flycatcher, black-and-white warbler, black-throated blue warbler, eastern screech-owl, hooded warbler, great crested flycatcher, great horned owl, red-eyed vireo, summer tanager, white-breasted nuthatch, and yellow-billed cuckoo (National Geographic 2002). Mammals observed in this forest during field review include armadillo, raccoon, opossum, cottontail rabbit, and white-tailed deer. Amphibians found in these forests, particularly along streams and wetlands in lowland sections of the forest and along the reservoir may include American toad, Cope's gray treefrog, chorus frog, cricket frog, eastern narrow-mouth toad, Fowlers toads, and green treefrog (Conant and Collins 1998). Reptiles that may be found in these forests include black kingsnake, eastern box turtle, gray rat snake, ring-necked snake, and worm snake (Conant and Collins 1998).

Rock outcrops were surveyed for wildlife during field reviews in August 2016. Outcrops have the potential to provide habitat for species such as small-footed bat and timber rattlesnake as well as salamanders and small mammals. Surveys determined that these outcrops were not suitable for small-footed bat due to lack of solar exposure and sediment build up in the cracks. Caches of nuts were observed in some of these outcrops suggesting they do support small mammals. Outcrops do appear suitable for snakes such as timber rattlesnake.

One karst feature was observed during field surveys. A hole between two rock features was observed. It appeared to be approximately 10 feet deep and 2 feet wide. Although the bottom of the hole was not observed, it is unlikely that this feature extends much deeper than 10 feet. No air flow could be detected and sediment build-up was apparent at the perceived bottom of the hole. Therefore it is likely that this feature does not provide suitable karst roosting habitat for bats. There are five records of caves within three miles of the BLN Property. The closest of these records is approximately 1.9 miles away.

Two heron colonies and many osprey nests were observed within the BLN Property. Heron nests were observed on two transmission line structures. Nine osprey nests were also observed

on transmission line structures on the BLN Property. Most of these nests occur near the plant facility itself near suitable foraging habitat (Town Creek and a pond on plant property). Many of these nests were observed active in 2016. Nests have been built and used in this area since at least 2010 (TVA 2010). Although no nests were observed in natural vegetation along Guntersville Reservoir, suitable nesting habitat for these species does occur along the reservoir. One recorded heronry occurs approximately 0.3 mile from the BLN Property. Two recorded osprey nests occur within three miles of the BLN Property, the closest of which is approximately 2.2 miles away.

Migratory birds are protected under the Migratory Bird Treaty Act. Several species of migratory birds could utilize forests, edge, and herbaceous habitats on the BLN property. These species include: blue-winged warbler, brown-headed nuthatch, Chuck-will's-widow, dickcissel, fox sparrow, Kentucky warbler, loggerhead shrike, Louisiana waterthrush, prairie warbler, prothonotary warbler, red crossbill, red-headed woodpecker, rusty blackbird, short-eared owl, wood thrush, and worm eating warbler. All of these birds are listed as birds of conservation concern with the highest priority for conservation (USFWS 2016a).

### 3.7.2 Environmental Consequences

#### 3.7.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. No changes to wildlife and their habitat occurring on the BLN Property are anticipated in the foreseeable future as no substantive changes to current activities are expected to occur under this alternative. There would be no impacts to terrestrial wildlife.

#### 3.7.2.2 Alternative B – Complete the Sale of the BLN Property

The majority of new construction is expected to occur within existing structures and previously disturbed areas. Numerous osprey nests and heron nests are active on developed areas within the BLN Property. Outside of these areas, habitats exist that support a more diverse assemblage of wildlife. Early successional, forested, wetland, rock outcrop, and karst habitats that support a variety of wildlife species occur across the undeveloped portions of the property. While construction could occur in these areas, any such future effects are not reasonably foreseeable as Nuclear Development has not finalized plans for the site. It is assumed for the purposes of this analysis that little of the undeveloped areas would be disturbed for the purposes of completion and operation of the nuclear units. TVA assumes Nuclear Development would adhere to all state and federal laws (including the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act) for actions that may impact wildlife or their habitats. It is expected that Nuclear Development would participate in future NEPA analyses to further analyze impacts to wildlife in conjunction with the NRC review and permitting process. To minimize potential impacts to migratory birds, Nuclear Development's new construction design could follow the USFWS Avian Protection Plan Guidelines and best practice recommendations for reducing bird collisions with buildings where feasible.

The 2008 COLA ER for construction and operation of two AP1000 units, using the existing cooling towers at the site, predicted the salt deposition rate to be too low to cause damage to wildlife in the vicinity of the BLN Property. As part of the NRC permitting and NEPA evaluation process once plans are finalized, it is assumed Nuclear Development would analyze the salt deposition rate for the completion of the two nuclear units on the BLN Site. It is anticipated that compliance with all applicable regulations and standards and use of best management practices, deposition of salts would remain low and impacts to wildlife in the area would be, at most, minor.

## 3.8 Vegetation

### 3.8.1 Affected Environment

The BLN Property is located on the west bank of the Tennessee River (Guntersville Reservoir) and lies within the Sequatchie Valley, a subregion of the Southwestern Appalachian Ecoregion. The Sequatchie Valley extends from the Tennessee border nearly one hundred miles southwest into Alabama. In the north, the open, rolling, valley floor, 600 feet in elevation, is nearly 1,000 feet below the top of the Cumberland Plateau and Sand Mountain. South of Blountsville, the topography becomes more hilly and irregular with higher elevations. The Tennessee River (Guntersville Reservoir) flows through the Sequatchie Valley, until it turns west near Guntersville where it leaves the valley. Similar to parts of the Ridge and Valley, this is an agriculturally productive region, with areas of pasture, hay, soybeans, small grain, corn, and tobacco (Griffith et al. 2001).

Terrestrial plant communities have been assessed, to varying extents, for multiple environmental reviews conducted on the BLN Property (TVA 1974, TVA 1997, TVA 2010, TVA 2011, TVA 2014). The majority of previous construction at the BLN Property occurred on previously disturbed young forest and agricultural fields (TVA 1974). More recent field reviews and the Land Use/Land Cover map provided for 2010 SEIS concur with the previous assessments that described five terrestrial vegetative communities existing within or adjacent to the BLN Property. The five terrestrial vegetative communities are: lawns and grassy fields, bottomland/riparian hardwood forests, mixed hardwood forests, pine-hardwood forests, and scrub-shrub-thickets. These terrestrial plant communities are common and representative within the Sequatchie Valley region.

Field surveys were conducted in August 2016 in a variety of habitats across the BLN Property. Survey areas were chosen using topographic photos and aerial photos with the goal of visiting habitats representative of the BLN Property as a whole. By and large, areas west of the ridgeline adjacent to the Tennessee River (Guntersville Reservoir), including the western slopes of the ridge, have been heavily disturbed by previous land use as indicated in other published reports (TVA 1974, TVA 1997, TVA 2010, TVA 2014). However, areas of mature deciduous and mixed evergreen-deciduous forest currently occupy many portions of the ridge tops and slopes facing the river. Though the mature forests are not continuous, these higher quality habitats are prevalent on slopes adjacent to the Tennessee River (Guntersville Reservoir) between the Town Creek confluence and the southern terminus of the BLN Property. These areas have not been surveyed in any detail since the early 1970s (TVA 1974).

Forest found in this part of the BLN Property can be divided into three primary types: bottomland, mesic slope, and xeric. Bottomland forest has mature trees typically averaging about 24” diameter at breast height (dbh) and was found on relatively flat areas adjacent to the Tennessee River (Guntersville Reservoir). Common overstory species included cherrybark oak, sugarberry, sweetgum, sycamore, willow oak, water oak, and yellow-poplar. While the overstory often has relatively large trees, the herbaceous layer was usually depauperate and often contained a monoculture of the non-native plant Japanese stiltgrass. While the bottomland sites have not been manipulated for decades (as indicated by the size of the trees), the prevalence of Japanese stiltgrass suggests that large scale disturbance like clearing and grazing probably occurred at some point in the past.

Mesic deciduous forest, which occurs on lower to mid slopes above the floodplain, contains a greater number of species and has, on the whole, been subjected to less disturbance. Common tree species in these habitats include American beech, blackgum, northern red oak, pignut hickory, red maple, shagbark hickory, sugar maple, white ash, white oak, and yellow-poplar. While the overstory trees in this habitat often averaged 24” dbh, multiple individual or small clusters of trees with a diameter greater than 30 to 40” were observed. Along more northern portions of the ridge line, limestone outcrops were observed on slopes above the Tennessee River (Guntersville Reservoir). These areas had a number of species that were not seen elsewhere on the BLN Property. Plants found on these calcareous sites include blue ash, chinquapin oak, purple cliffbrake, smooth oxeye, snow squarestem, and white wingstem. Further to the south, the limestone outcrops were gave way to chert outcrops and more acidic soils. Common understory plants in these stands included black cohosh, Christmas fern, jack in the pulpit, oak leaf hydrangea, and various sedges, but the understory was open in many areas. These areas of open understory seemed to correlate with steeper slopes where loose chert was found continuously on the forest floor.

The most unique plant communities on the BLN Property were the upper slopes of the steeper ridges above the Tennessee River (Guntersville Reservoir). These deciduous and mixed evergreen deciduous stands possess a unique structure and species assemblage. Along with dry site oaks (black, chestnut, and scarlet) and hickories (mockernut and shagbark), these stands also contained shortleaf and Virginia pine in the overstory. The woody plants in the midstory and understory included azaleas, blueberries, mountain laurel, muscadine, sassafras and sourwood. The sites where these plant communities occurred were very steep, often with 100 percent slopes. Presumably the steepness of the terrain was the factor responsible for the broken forest canopy. The resulting uneven age canopy had a mixture of very large trees and thicket-like habitats with small trees in the openings. Chestnut oaks ranging from 30-40” dbh were observed at several locations. While individual trees were not quantitatively aged, the dry and excessively drained nature of these sites suggests that these overstory trees could be hundreds of years old.

*Invasive Non-Native Species (Plants)*

Most lands in and around the TVA power service area have been affected by introduced non-native plant species. Non-native plants are known to occur across Southern Appalachian

forests, accounting for 15-20 percent of the documented flora (Miller et al. 2010). According to Morse et al. (2004), invasive non-native species are the second leading threat to imperiled native species. Not all non-native species pose threats to our native ecosystems. Many species introduced by European settlers, are naturalized additions to our flora and considered to be non-native, non-invasive species. These “weeds” have very little negative impacts to native vegetation. Examples of these are Queen Anne’s lace and dandelion. However, other non-native species are considered to be Exotic Invasive Species and do pose threats to the natural environment. EO 13112 defines an invasive species as any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem, and whose introduction does or is likely to cause economic or environmental harm or harm to human health.

The Alabama Invasive Plant Council (2006) reports six of the top ten Alabama worst weeds as occurring in Jackson County, Alabama. These exotic weeds which pose a severe threat to native ecosystems are Alligator weed, Eurasian water milfoil, cogon grass, Chinese privet, hydrilla, kudzu, multiflora rose, and tropical soda apple. Cogongrass, hydrilla, and tropical soda apple are also on Federal Noxious Weed list (USDA 2012). Field observations made in 2007, 2008, 2011, and 2014 within the BLN reservation noted an abundance of Chinese privet and Japanese honeysuckle along with dandelion, Japanese stiltgrass, mimosa, multiflora rose, sericea lespedeza and tall fescue. In addition, 2016 surveys located a single occurrence of the non-native swordfern (*Macrothelypteris torresiana*). This tropical species appears to be expanding its range northward; the BLN Property collection is the first report of this species in northern Alabama.

### 3.8.2 Environmental Consequences

#### 3.8.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the “as-is” condition and the site would continue to be secured and monitored. There would be no impacts to the terrestrial plant ecology of the area. In addition, invasive plant species present onsite would not be disturbed; therefore, this alternative would not contribute to the spread or introduction of exotic invasive plant species on or near the BLN Property.

#### 3.8.2.2 Alternative B – Complete the Sale of the BLN Property

Construction would be expected to occur primarily within the existing structures and disturbed areas of the BLN Property. Some construction could occur outside these areas resulting in minor clearing of some terrestrial vegetation. Any clearing would take place in accordance with an SPCC plan and best management practices designed to minimize impacts. Disturbed areas would be revegetated once construction is complete. Therefore, no indirect effects to terrestrial vegetation are expected. Criteria gaseous or particulate air pollutants emitted from the facility during construction or operation would be intermittent and limited in amount and would have no adverse direct or indirect effect on terrestrial vegetation. Unique stands of deciduous and mixed evergreen deciduous forest occurring on steep slopes above the Tennessee River would be adversely affected if the land were converted for other uses. These small areas contain stands

of mature trees that may be hundreds of years old and could be considered old growth forest. However, the likelihood of project-related clearing occurring in these steep inaccessible areas is very small.

The 2008 COLA ER for construction and operation of two AP1000 units, using the existing cooling towers at the site, predicted the salt deposition rate to be too low to cause damage to vegetation in the vicinity of the BLN Property. As part of the NRC permitting and NEPA evaluation process once plans are finalized, it is assumed Nuclear Development would analyze the salt deposition rate for the completion of the two nuclear units on the BLN Site. It is anticipated that compliance with all applicable regulations and standards and use of best management practices, deposition of salts would remain low and impacts to vegetation in the area would be, at most, minor.

## 3.9 Threatened and Endangered Species

### 3.9.1 Aquatic Species – Threatened and Endangered Species

#### 3.9.1.1 Affected Environment

The Endangered Species Act provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered in the United States or elsewhere. The Act outlines procedures for federal agencies and others to follow when taking actions that may jeopardize federally listed species or their designated critical habitat. The policy of Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the Act's purposes. The prohibitions regarding impacts to listed species is not restricted to federal entities but applies to all persons and organizations subject to the jurisdiction of the United States, therefore, these prohibitions would also apply to any actions Nuclear Development would take at the BLN Property.

The State of Alabama provides protection for species considered threatened, endangered, or deemed in need of management within the state other than those federally listed under the Endangered Species Act. The listing is handled by the Alabama Department of Conservation and Natural Resources; however, the Alabama Natural Heritage Program and TVA both maintain databases of aquatic animal species that are considered threatened, endangered, special concern, or tracked in Alabama.

Three federally listed and an additional five state-listed endangered aquatic species are known to occur within a 10-mile radius of the BLN Property (Table 3.9-1). The orange-foot pimpleback, sheepnose, and winged mapleleaf, all federally endangered species, are known from historic records in Guntersville Reservoir (TVA 2010). Fourteen federally listed aquatic species are known to occur in Jackson County, Alabama. These include two fish, one snail, and eleven mussels. There are historic records of six other federally listed mussels in Jackson County, but those species are presumed extirpated from Guntersville Reservoir. Only one federally protected species has been documented in Guntersville Reservoir in the vicinity of the BLN Property, the pink mucket (TVA 2010).

The pink mucket is a medium sized freshwater mussel that can exceed 50 years in age. It prefers sand, gravel and pockets between rocky ledges in high velocity areas and mud and sand in slower moving waters. Known host fishes are Sauger, Freshwater Drum, Largemouth Bass, Spotted Bass, Smallmouth Bass, and Walleye (Parmalee and Bogan 1998).

In addition to the TVA Natural Heritage and Alabama State Heritage data, the USFWS IPaC county list indicates two additional mussels (Cumberland bean [E] and rough pigtoe [E]).

**Table 3.9-1. Records of federal and state-listed aquatic animal species from Jackson County, Alabama and/or within a 10-mile radius of the BLN Property.[1]**

| Common Name | Scientific Name | Element Rank[2] | Status[3] | |
|---|---|---|---|---|
| | | | Federal | State (Rank)[4] |
| **Crayfish** | | | | |
| Southern Cave Crayfish | *Orconectes australis australis* | E | | TRKD (S3) |
| **Fishes** | | | | |
| Blotched Chub | *Erimystax insignis* | E | | TRKD (S2) |
| Blotchside Logperch | *Percina burtoni* | E | | TRKD (S1) |
| Palezone Shiner | *Notropis albizonatus* | E | END | PROT (S1) |
| Snail Darter | *Percina tanasi* | E | THR | PROT (S1) |
| Southern Cavefish | *Typhlichthys subterraneus* | E | | PROT (S3) |
| **Insects** | | | | |
| A Caddisfly | *Rhyacophilia alabama* | E | | PROT (S1) |
| A Glossosomatid Caddisfly | *Agapetus hessi* | E | | TRKD (S1) |
| **Mussels** | | | | |
| Alabama Lampmussel | *Lampsilis virescens* | E | END | PROT (S1) |
| Alabama Rainbow | *Villosa nebulosa* | E | | TRKD (S3) |
| Black Sandshell | *Ligumia recta* | E | | TRKD (S2) |
| Butterfly | *Ellipsaria lineolata* | E | | TRKD (S3) |
| Cumberland Moccasinshell | *Medionidus conradicus* | E | | PROT (S1) |
| Deertoe | *Truncilla truncata* | E | | TRKD (S1) |
| Elktoe | *Alasmidonta marginata* | H | | EXTI (SX) |
| Fine-rayed Pigtoe | *Fusconaia cuneolus* | E | END | PROT (S1) |
| Flutedshell | *Lasmigona costata* | H | | PROT (S2) |
| Hickorynut | *Obovaria olivaria* | H | | EXTI (SX) |
| Kidneyshell | *Ptychobranchus fasciolaris* | E | | TRKD (S2) |

| | | | | |
|---|---|---|---|---|
| Long-solid | *Fusconaia subrotunda* | E | | TRKD (S1) |
| Monkeyface | *Quadrula metanevra* | E | | TRKD (S3) |
| Mucket | *Actinonaias ligamentina* | E | | TRKD (S2) |
| Narrow Catspaw | *Epioblasma lenior* | H | | EXTI (SX) |
| Ohio Pigtoe | *Pleurobema cordatum* | E | | TRKD (S2) |
| Orange-foot Pimpleback | *Plethobasus cooperianus* | H | END | PROT (S2) |
| Painted Creekshell | *Villosa taeniata* | E | | TRKD (S3) |
| Pale Lilliput | *Toxolasma cylindrellus* | E | END | PROT (S1) |
| Pheasantshell | *Actinonaias pectorosa* | E | | TRKD (S1) |
| Pink Mucket | *Lampsilis abrupta* | E | END | END (S2) |
| Purple Lilliput | *Toxolasma cylindrellus* | E | END | PROT (S1) |
| Pyramid Pigtoe | *Pleurobema rubrum* | H | | PROT (S2) |
| Rabbitsfoot | *Quadrula cylindrica cylindrica* | E | THR | PROT (S1) |
| Rainbow | *Villosa iris* | E | | TRKD (S3) |
| Round Hickorynut | *Obovaria subrotunda* | E | | TRKD (S2) |
| Sheepnose | *Plethobasus cyphyus* | H | END | PROT (S1) |
| Shiny Pigtoe | *Fusconaia cor* | E | END | PROT (S1) |
| Slabside Pearlymussel | *Lexingtonia dolabelloides* | E | END | PROT (S1) |
| Slippershell Mussel | *Alasmidonta viridis* | E | | PROT (S1) |
| Snuffbox | *Epioblasma triquetra* | E | END | TRKD (S1) |
| Spike | *Elliptio dilatata* | E | | TRKD (S1) |
| Tennessee Clubshell | *Pleurobema oviforme* | E | | TRKD (S1) |
| Tennessee Heelsplitter | *Lasmigona holstonia* | E | | TRKD (S1S2) |
| Tennessee Pigtoe | *Fusconaia barnesiana* | E | | TRKD (S1) |
| Wavyrayed Lampmussel | *Lampsilis fasciola* | E | | TRKD (S1S2) |
| White Heelsplitter | *Lasmigona complanata* | H | | TRKD (S2S3) |
| Winged Mapleleaf | *Quadrula fragosa* | H | | PROT (S1) |
| **Snails** | | | | |
| Anthony's River Snail | *Athearnia anthonyi* | E | END | PROT (S1) |
| Corpulent Hornsnail | *Pleurocera corpulenta* | E | | TRKD (S1) |
| Spiny Riversnail | *Io fluvialis* | H | | EXTI (SX) |
| Varicose Rocksnail | *Lithasia verrucosa* | E | | TRKD (S3) |

Source: TVA Natural Heritage Database, queried by C. Phillips on 8/15/16
[1]Status Codes: END= Listed Endangered; THR = Threatened; PROT = State protected; EXTI = Listed Extirpated or Extinct; TRKD = Tracked by state Natural Heritage program.
[2]State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; SX = Presumed Extirpated
[3]Historical = Element occurrence is greater than 25 years old.

#### 3.9.1.2 Environmental Consequences

*Alternative A – No Action*

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. Existing discharge to Guntersville Reservoir is in accordance with NPDES permits, which are designed to maintain water quality and aquatic habitat conditions that are suitable for aquatic life, including federally listed and state-listed species. Therefore, there would be no impacts to federally listed or state-listed threatened or endangered aquatic species under the No Action Alternative.

*Alternative B – Complete the Sale of the BLN Property*

The majority of new construction is expected to occur within existing structures and previously disturbed areas. Intake and discharge structures for the nuclear unit are already in place and new construction is not expected to occur near the banks of the reservoir. Accidental discharge and stormwater runoff is limited under the construction SWPPP and a site-specific SPCC plan, which would be implemented prior to initiating construction. Refurbishment of the intake and discharge structures or the barge dock could occur and would be done in accordance with the applicable USACE permits. All site construction would be conducted using appropriate best management practices, and no discharge-related impacts would occur.

Dredging the intake channel, should it be required, could adversely affect the listed species present in the potentially affected areas. Due to the poor quality habitat and low densities of mussels present in the project area, few individuals would likely be directly harmed. The greatest number of mussels affected would be individuals inhabiting areas surrounding, and particularly downstream of, dredged areas in the main channel of the Tennessee River. Mussels in those areas would be indirectly affected by turbulence and the suspension and deposition of fine sediments. Although brief and temporary, turbulence and suspended silt could interfere with respiration, feeding, and reproductive activity of federally listed mussels. The use of best management practices such as silt curtains should limit the area affected by suspended sediments and sedimentation.

Mussels also may be indirectly affected by tows delivering barges to the BLN Property. Effects from tow propeller wash include brief periods of extreme turbulence, increased suspended sediments, scouring of substrate (and mussels) from the riverbed, and accumulation of fine sediments in the surrounding area. Subsequent effects could interfere with mussel respiration, feeding, and reproductive activity, including interactions with potential fish hosts; such effects may last months to years.

Discharge of chemicals needed to operate the plant is not expected to harm aquatic species. Concentrations of chemicals added to cooling tower blowdown are very small by the time they are discharged to the Tennessee River (Guntersville Reservoir). The discharge must be regulated and monitored under an NPDES permit. Types and relative concentrations of chemical discharges resulting from the operation of a nuclear plant would likely be similar to those at TVA's Watts Bar Nuclear and Browns Ferry Nuclear facilities. Whole effluent toxicity

studies were conducted on discharge from Watts Bar Nuclear Plant that included testing on freshwater mussels (TVA 1995). The freshwater mussels used in this testing proved to be less sensitive than fathead minnow and *Daphnia*. These monitoring and experimental data indicated that mussels and fish would not be affected even if exposed to undiluted effluent from Watts Bar Nuclear plant discharge. The parameter and discharge limits of the NPDES permit are imposed by the State of Alabama. The conditions of this permit are considered to be protective of water resources and designated water uses of the receiving water body. The State additionally retains the authority to require Nuclear Development to conduct additional monitoring to ensure that use of the BLN Property would comply with state water quality criteria and applicable NPDES permit conditions to ensure protection of the receiving water body.

Exposure to heated effluent may cause minor indirect effects to federally listed mussels by stressing the fish that carry larval mussels in their gills. Thermal effluent is not expected to harm mussels inhabiting the bottom of the river directly. Exposure to heated discharge is expected to be minimal based on the river size and morphology. Therefore, potential thermal effects would be expected to be minor.

Operational effects may also include impingement and entrainment of aquatic organisms as discussed in Section 3.6. Impingement and entrainment could affect fish species that may serve as hosts for mussel larva such as largemouth bass, smallmouth bass, spotted bass, freshwater drum, sauger, stoneroller, white crappie, and walleye. With application of current 316a and 216b regulations, effects on these species are anticipated to be minor, and would not have a measureable adverse indirect effect on the listed aquatic species.

As Nuclear Development has not finalized plans for the site, the extent of impacts to listed species under the Endangered Species Act and necessary mitigation is unknown. Therefore, TVA is not planning to reinitiate consultation with the USFWS. It is assumed Nuclear Development would comply with applicable laws. In a letter dated April 15, 2010, in response to TVA's consultation with respect to the 2010 SEIS, the USFWS issued an Endangered Species Act biological opinion (BO) for construction and operation of one unit at the BLN Property. The BO contains an "incidental take" permit that allows for impacts to the federally listed endangered pink mucket. If either action alternative evaluated in the 2010 SEIS had been implemented, TVA would have provided a total of $30,000 to be used for research and recovery of pink mucket and high priority mollusks within their historic ranges (2010 SEIS Vol. 2, Appendix H). As neither action alternative was pursued, this transaction has not occurred, and TVA is no longer required to commit to this payment. TVA assumes Nuclear Development may be required to apply for a TVA Section 26a permit should site development occur. TVA would review any application and determine if any additional coordination with USFWS is required for issuance of this permit. NRC would conduct consultation with the USFWS as part of the environmental review process for any application submitted by Nuclear Development. with the NRC. Impacts and potential mitigation associated with federally listed species would be reviewed and reassessed at that time. With such compliance activities, effects to listed species are expected to be minor.

### 3.9.2 Wildlife – Threatened and Endangered Species

#### 3.9.2.1 Affected Environment

Review of the TVA Regional Natural Heritage database in August 2016 determined that one federally protected species (bald eagle) and one Alabama state-listed species (green salamander) have been documented within three miles of the BLN Property. Records for three federally-listed species (gray bat, Indiana bat, and northern long-eared bat) occur within Jackson County, Alabama, but not within three miles of the project area (Table 3.9-2). No federally or state-listed terrestrial animal species were observed during field surveys conducted in August 2016.

**Table 3.9-2. Federally-listed terrestrial animal species reported from Jackson County, Alabama, and other species of conservation concern documented within three miles of the BLN Property[1]**

| Common Name | Scientific Name | Status[2] Federal | Status[2] State (Rank[3]) |
|---|---|---|---|
| **Amphibians** | | | |
| Green salamander | *Aneides aeneus* | -- | PROT(S3) |
| **Birds** | | | |
| Bald eagle | *Haliaeetus leucocephalus* | DM | PROT(S4B) |
| **Mammals** | | | |
| Gray bat[4] | *Myotis grisescens* | LE | PROT(S2) |
| Northern long-eared bat[4] | *Myotis septentrionalis* | LT | PROT(S2) |
| Indiana bat[4] | *Myotis sodalis* | LE | PROT(S2) |

[1] Source: TVA Regional Natural Heritage Database, extracted 08/15/2016; USFWS IPaC, extracted 08/15/2016.
[2] Status Codes: DM = Delisted, recovered, and still being monitored; LE = Listed Endangered; LT = Listed Threatened; PROT = Protected.
[3] State Ranks: S2 = Imperiled; S3 = Vulnerable; S4 = Apparently secure; S#B = Rank of Breeding population.
[4] Federally listed species reported from Jackson County, Alabama, but not within three miles of project area.

Green salamanders are found in damp areas including rocky outcrops and ledges, beneath loose bark or cracks of trees, and under logs. Eggs are laid in similarly moist, dark places (Petranka 1998). The nearest record of this species exists approximately 2.4 miles from the BLN Property. Outcrops observed on the BLN Property were also not suitable for green salamander due to lack of sufficient moisture despite presence of moss. However, suitable habitat does exist for green salamander under logs and in trees throughout mature forests along Guntersville Reservoir, though no green salamanders have been recorded within the BLN Property.

Bald eagles are protected under the Bald and Golden Eagle Protection Act (USFWS 2013). This species is associated with large, mature trees capable of supporting its massive nests. These are usually found near larger waterways where eagles forage (Turcotte and Watts 1999). This species is frequently observed along on Guntersville Reservoir. The closest documented nest is approximately 0.3 miles from the BLN Property. Suitable nesting habitat for this species is available along ridge tops and bluffs along Guntersville Reservoir. Suitable foraging habitat is available in Guntersville Reservoir and in Town Creek.

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (Tuttle 1976). Gray bats are prevalent on Guntersville Reservoir (Best et al. 1995). There are ten records of this species known from Jackson County including two large hibernacula. The closest record is approximately 6.6 miles away. There are no suitable roosting structures for gray bat in the BLN Property. However bodies of water including ponds, wetlands, streams and Guntersville Reservoir offer suitable foraging habitat for this species.

Indiana bats hibernate in caves in winter and use areas around them in fall and spring for swarming and staging, prior to migration back to summer habitat. During the summer, Indiana bats roost under the exfoliating bark of dead and living trees in mature forests with an open understory often near sources of water. Indiana bats are known to change roost trees frequently throughout the season, yet still maintain site fidelity, returning to the same summer roosting areas in subsequent years. This species forages over forest canopies, along forest edges, and tree lines, and occasionally over bodies of water (Pruitt and TeWinkel 2007, Kurta et al. 2002, USFWS 2016b). Five records of Indiana bat occur in Jackson County, including one large hibernaculum. The closest record of this species is a hibernacula record approximately 7.2 miles away. Although no suitable winter roosting habitat occurs on the BLN Property, suitable summer roosting habitat for Indiana bat does exist (see summer habitat description: USFWS 2016b). The mature oak-hickory forests along Guntersville Reservoir provide higher quality habitat and include at least 59 shagbark hickories, 50 white oaks, and 46 snags suitable for summer roosting Indiana bats. Some suitable trees in this area were very large including a white oak that was 54 inches in diameter. Canopy gaps above snags in this area provide solar exposure for roosting bats. The open understory and thin midstory in these areas are ideal for navigation through the forest. Suitable roost trees were also observed in lower quality habitat in forest fragments closer to the plant facility. Suitable roosting habitat for Indiana bat totals approximately 666 acres across the current BLN reservation and approximately 575 acres within the proposed BLN Property sale boundary. Foraging habitat occurs above and along the forest, as well as over Guntersville Reservoir, streams, and wetlands.

The northern long-eared bat predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees. Roost selection by northern long-eared bat is similar to Indiana bat; however it is thought that northern long-eared bats are more opportunistic in roost site selection. This species has also been documented roosting 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). Eleven records of northern long-eared bat are known from Jackson County, Alabama, including two extant hibernacula. The closest of these records is approximately 7.2 miles away. Although no suitable winter roosting habitat occurs on the BLN Property, suitable summer roosting habitat for NLEB does exist (see summer habitat description: USFWS 2016b). The mature forests along Guntersville Reservoir also provide suitable for summer roosting northern long-eared bats.

#### 3.9.2.2 Environmental Consequences

*Alternative A – No Action*

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. No changes to federally or state-listed species and their habitat occurring on the BLN Property are anticipated in the foreseeable future as no substantive changes to current actions are expected to occur under this alternative. Therefore, there would be no impacts to federally or state-listed terrestrial animal species under the No Action Alternative. Habitat suitable for these species, including foraging areas used by gray bats, would not be affected under this alternative.

*Alternative B – Complete the Sale of the BLN Property*

The majority of new construction is expected to occur within existing structures and previously disturbed areas. While construction could also occur outside these areas where suitable habitat for federally and state-listed species occurs (green salamander, bald eagle, gray bat, Indiana bat, and northern long-eared bat), any such future effects are not reasonably foreseeable as Nuclear Development has not finalized plans for the site. Therefore, potential additional clearing needs are unknown at this time. Because impacts to biological resources can be time sensitive, additional consultation with USFWS is not warranted under Section 7 of the Endangered Species Act until project plans are finalized. TVA assumes Nuclear Development would adhere to all state and federal laws (including the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act) for actions that may impact state and federally listed species or their habitats. Further evaluation of impacts to wildlife would be considered as part of the NEPA analysis conducted in compliance with the NRC permit requirements.

The 2008 COLA ER for construction and operation of two AP1000 units, using the existing cooling towers at the site, predicted the salt deposition rate to be too low to cause damage to threatened and endangered species in the vicinity of the BLN Property. As part of the NRC permitting and NEPA evaluation process once plans are finalized, it is expected Nuclear Development would analyze the salt deposition rate for the completion of the two nuclear units on the BLN Site. It is anticipated that compliance with all applicable regulations and standards and use of best management practices, deposition of salts would remain low and impacts to threatened and endangered species in the area would be, at most, minor.

### 3.9.3 Vegetation – Threatened and Endangered Species

#### 3.9.3.1 Affected Environment

An August 2016 review of the TVA heritage database indicated there are 24 Alabama state-listed plant species known to occur within 5 miles of the BLN Property; five plants with federal status have been previously reported from Jackson County, Alabama (Table 3.9-3). A discussion of each federally listed species found within Jackson County can be found in the BLN Final SEIS (TVA 2010). Based on field reviews conducted in 2007, 2008, 2011, 2014, and 2016, no plant species of conservation concern occur on the BLN Property. In addition, no

USFWS designated critical habitat for federally listed plants occurs on or adjacent to the BLN Property.

**Table 3.9-3. State-listed plants previously reported from within a 5 mile vicinity of the BLN Property and species with federal status known from Jackson County, Alabama.[1]**

| Common Name | Scientific Name | Federal Status[2] | State Status[2] | State Rank[3] |
|---|---|---|---|---|
| Price's Potato-bean[4] | *Apios priceana* | THR | SLNS | S2 |
| American Hart's-tongue Fern[4] | *Asplenium scolopendrium* var. *americanum* | THR | SLNS | S1 |
| Nuttall's Rayless Golden-rod | *Bigelowia nuttallii* | - | SLNS | S3 |
| Sedge | *Carex purpurifera* | - | SLNS | S2 |
| Wister Coral-root | *Corallorhiza wisteriana* | - | SLNS | S2 |
| Woodland Tickseed | *Coreopsis pulchra* | - | SLNS | S2 |
| American Smoke-tree | *Cotinus obovatus* | - | SLNS | S2 |
| Harper's Dodder | *Cuscuta harperi* | - | SLNS | S2 |
| Tennessee Bladderfern | *Cystopteris tennesseensis* | - | SLNS | S2 |
| Creeping Aster | *Eurybia surculosa* | - | SLNS | S1 |
| White-leaved Sunflower | *Helianthus glaucophyllus* | - | SLNS | SH |
| Longleaf Sunflower | *Helianthus longifolius* | - | SLNS | S1S2 |
| Goldenseal | *Hydrastis canadensis* | - | SLNS | S2 |
| Butler's Quillwort | *Isoetes butleri* | - | SLNS | S2 |
| Twinleaf | *Jeffersonia diphylla* | - | SLNS | S2 |
| Michaux Leavenworthia | *Leavenworthia uniflora* | - | SLNS | S2 |
| Clematis morefieldii[4] | *Morefield's Leather-flower* | END | SLNS | S2 |
| Alabama Snow-wreath | *Neviusia alabamensis* | - | SLNS | S2 |
| One-flowered Broomrape | *Orobanche uniflora* | - | SLNS | S2 |
| Great Yellow Wood-sorrel | *Oxalis grandis* | - | SLNS | S1 |
| White Fringeless Orchid[4] | *Platanthera integrilabia* | THR | SLNS | S2 |
| Tennessee Leafcup | *Polymnia laevigata* | - | SLNS | S2S3 |
| Prickly Gooseberry | *Ribes cynosbati* | - | SLNS | S1S2 |
| Green Pitcher Plant[4] | *Sarracenia oreophila* | END | SLNS | S2 |
| Sunnybell | *Schoenolirion croceum* | - | SLNS | S2 |
| Cumberland Rosinweed | *Silphium brachiatum* | - | SLNS | S2 |
| Southern Red Trillium | *Trillium sulcatum* | - | SLNS | S1 |
| Horse-gentian | *Triosteum angustifolium* | - | SLNS | S1 |
| Canada Violet | *Viola canadensis* | - | SLNS | S2 |

[1] Source: TVA Natural Heritage Database, queried August 2016
[2] Status Codes: END = Listed Endangered; PT = Proposed Threatened; SLNS = State Listed, no status assigned; THR = Listed Threatened.
[3] State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; SH = Possibly Extirpated (Historical); S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2)
[4] Federal-listed species occurring within the county where work would occur, but not within 5 miles of the project area

#### 3.9.3.2 Environmental Consequences

*Alternatives A and B*

Because no federally listed, candidates for federal listing, or state-listed species are known to occur within the BLN Property, and no habitat suitable to support these species is present, no adverse impacts to federally listed or state-listed plant species would occur under any of the alternatives.

## 3.10 Air Quality

### 3.10.1 Affected Environment

Pursuant to the Clean Air Act, the EPA established National Ambient Air Quality Standards (NAAQS) and directs the states to develop State Implementation Plans to achieve these standards. This is primarily accomplished through permitting programs that establish limits for emissions of air pollutants.

The EPA has established NAAQS for six criteria air pollutants: carbon monoxide, nitrogen oxides, ozone, sulfur dioxide, lead, and particulate matter (PM). Primary standards protect public health while secondary standards protect public welfare (e.g. visibility, crops, forests, soils, and materials). Ambient air monitors measure concentrations of these criteria pollutants to determine attainment with these standards. Areas where these measurements exceed the standards are designated as non-attainment areas. New emission sources to be located in or near these areas are subject to more stringent air permitting requirements.

A pertinent “air-shed” for the BLN Property cannot be defined as parcels of air move among undefined boundaries, and regional pollutants are capable of long-range transport. Jackson County, Alabama is located within the Tennessee River Valley (Alabama)-Cumberland Mountains (Tennessee) Interstate Air Quality Control Region. This region includes Colbert, Cullman, DeKalb, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marion, Marshall, Morgan, and Winston counties in Alabama and Bledsoe, Coffee, Cumberland, Fentress, Franklin, Grundy, Marion, Morgan, Overton, Pickett, Putnam, Scott, Sequatchie, Warren, White, and Van Buren counties in Tennessee (40 CFR §81.72). The 100-mile radius around the BLN Property includes much of this air quality control region and, for the purposes of this EA, is evaluated as the potentially affected environment with respect to air quality.

In Alabama, Jefferson and Shelby Counties, both located within 100 miles of the BLN Property, are designated as in maintenance for PM2.5 24 Hr (2006 standard). In Georgia, Bartow, Cherokee, Paulding, Cobb, DeKalb, Fulton, Douglas Counties are designated as in non-attainment for 8-Hr Ozone (2008 standard). These Georgia counties are located within 100 miles of the BLN Property, though they are outside of the Tennessee River Valley (Alabama)-Cumberland Mountains (Tennessee) Interstate Air Quality Control Region. All other counties within 100 miles of the BLN Property are in attainment for all NAAQS standards (EPA 2016a).

Class 1 areas are locations where air quality is deemed especially sensitive such as national parks and wilderness areas, and receive heightened protection under the Clean Air Act. The two Class 1 areas nearest to the BLN Property are the Cohutta Wilderness, located in north

Georgia, and the Sipsey Wilderness, located in north Alabama. Both are outside the 100-km radius from the BLN Property.

### 3.10.2 Environmental Consequences

#### 3.10.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. Closure of the two former firing ranges on the BLN Property could result in approximately 13 truck trips hauling up to 225 cubic yards of soil from the BLN Property to a permitted offsite disposal facility. These truck trips would result in contributions to vehicle emissions along the routes between the BLN Property and the disposal locations. Though the disposal locations are unknown at present, it is assumed they would be located within a maximum of a one day drive from the BLN Property. The trucks would primarily travel along major roadways such as highways and interstates. Travel along minor roadways would typically occur only over short distances or in the event of detours. The contribution of up to 13 truck trips from the BLN Property to the disposal facilities would be temporary and occur over the course of two to three weeks. Overall the vehicle emissions would be distributed over time, over distance, and along roadways that experience thousands of vehicle trips per day. Therefore, no impacts to air quality under Alternative A would be anticipated.

#### 3.10.2.2 Alternative B – Complete the Sale of the BLN Property

Air pollutant emissions would be generated during construction activities at the BLN Property. Combustion of gasoline and diesel fuels by internal combustion engines (vehicles, generators, construction equipment, etc.) would generate local emissions of particulate matter, nitrogen oxides, carbon monoxide, volatile organic compounds, and sulfur dioxide. Construction activities would also generate fugitive dust. Use of best management practices such as covered loads and wet suppression would minimize emissions of fugitive dust and it is assumed Nuclear Development would keep construction equipment properly maintained to minimize vehicle emissions. Air quality impacts from construction activities would be temporary, and would depend on both man-made factors (intensity of activity, control measures, etc.) and natural factors such as wind speed and direction, soil moisture and other factors. However, even under unusually adverse conditions, these emissions would have, at most, a minor transient impact on offsite air quality and would be well below the applicable ambient air quality standard. Given the relatively low number (based on assumed construction activities) and types of equipment that would be used for the construction activities, and the intermittent nature of construction, overall, the potential impacts to air quality from construction-related activities for the project would be temporary and minor.

Under Alternative B, intermittent operation of emergency diesel generators and potentially auxiliary boilers during plant operations would emit small amounts of air pollutants. It is assumed these emissions would be controlled to meet all applicable regulatory requirements. Nuclear Development would presumably obtain and maintain all appropriate permits. Therefore, impacts to air quality associated with operations at the BLN Property are expected to be minor.

TVA assumes approximately 3,900 construction workers may be onsite during construction at the BLN Property. It is assumed that approximately 800 employees would be onsite during standard operations while an additional approximately 800 may be onsite during scheduled refueling operations. Workforce commuting during both construction and operations would represent an increase from the current traffic in the vicinity of the BLN Property. Emissions related to personal vehicles would likely occur for only a few hours each day, during shift changes. Gasoline and diesel emissions are controlled to meet applicable regulatory requirements with respect to fuel and fuel alternatives. Due to fuel regulations and the intermittent nature of these emissions, the resulting impacts associated with a commuting workforce are expected to be minor.

The effects of closure of the two former firing ranges on the BLN Property would be similar to those described under Alternative A in Subsection 3.10.2. As with Alternative A, no impacts to air quality as a result of closure and remediation of the firing ranges at BLN under Alternative B would be anticipated.

## 3.11 Climate Change

### 3.11.1 Affected Environment

The 2014 National Climate Assessment concluded that global climate is projected to continue to change over this century and beyond. U.S. average temperature has increased by 1.3 degrees Fahrenheit (°F) to 1.9°F since 1895, and most of this increase has occurred since 1970. The most recent decade has been reported as the nation's warmest on record. Temperatures are projected to rise another 2°F to 4°F in most areas of the United States over the next few decades. The amount of warming projected beyond the next few decades is directly linked by many scientists to the cumulative global emissions of heat-trapping greenhouse gases (GHGs) and particles. By the end of this century, a roughly 3°F to 5°F rise is projected under a lower GHG emissions scenario, and a 5°F to 10°F rise is projected for a higher GHG emissions scenario. In both projections emissions are predominantly from fossil fuel combustion (Melillo et. al. 2014). There is significant uncertainty in these projections.

#### 3.11.1.1 Southeastern United States

The southeastern United States, including the State of Alabama, is one of the few regions globally that does not exhibit an overall warming trend in surface temperature over the 20th century. The region warmed during the early part of last century, cooled for a few decades, and is now warming again. The lack of an overall upward trend over the entire period of 1900-2012 is unusual compared to the rest of the U.S. and the globe. This feature has been dubbed the "warming hole" and has been the subject of considerable research, although a conclusive cause has not been identified (Kunkel et al. 2013). From 1970 to the present, temperatures have increased by an average of 2°F, with higher average temperatures during summer months. There have been increasing numbers of days above 95°F and nights above 75°F, and decreasing numbers of extremely cold days since 1970.

Increasing temperatures and the associated increase in frequency, intensity, and duration of extreme heat events will affect public health, natural and built environments, energy, agriculture,

and forestry. Higher temperatures also contribute to the formation of harmful air pollutants and allergens. Ground-level ozone, an air pollutant which generally increases with rising temperatures, is projected to increase in the 19 largest urban areas of the Southeast, leading to an increase in deaths. Heat stress also adversely affects dairy and livestock production, and is projected to reduce crop productivity, especially when coupled with increased drought (Melillo et. al. 2014).

In the last three decades, the percentage of the Southeast region experiencing moderate to severe drought increased, according to the Palmer Drought Severity Index (EPA 2010). Drought conditions can negatively affect agriculture, water supplies, energy production, and many other aspects of society. Lower streamflow and groundwater levels can also harm plants and animals, and dried-out vegetation increases the risk of wildfires. The primary cause of droughts is an extended period of deficient precipitation. The intensity of droughts can be exacerbated by increased rates of evaporation (due to high temperatures), high winds, lack of cloud cover, and/or low humidity (EPA 2016b).

The southeastern U.S. leads the nation in number of wildfires, averaging 45,000 fires per year, and this number continues to increase. Increasing temperatures contribute to increased fire frequency, intensity, and size (Melillo et. al. 2014). The Southeast region experiences a wide range of extreme weather and climate events that affect human society, ecosystems, and infrastructure. Since 1980, the Southeast has experienced more billion-dollar weather disasters than any other region in the U.S although this increase may be do more to the increase in the value of the assets rather than the severity of events. Climatic phenomena that have major impacts on the Southeast include: heavy rainfall and floods, extreme heat and cold, winter storms (in northern regions), severe thunderstorms and tornadoes, and tropical cyclones (Kunkel et al. 2013).

#### 3.11.1.2 Greenhouse Gases

Similar to the glass in a greenhouse, certain gases in the atmosphere absorb heat that is radiated from the surface of the Earth and that would otherwise have escaped the atmosphere. These gases are primarily carbon dioxide ($CO_2$), methane (CH4), nitrous oxide ($NO_x$)), perflurocarbons (PFCs), sulfur hexafluoride (SF6), and hydroflurocarbons (HFCs). Increases in the atmospheric concentrations of these gases can cause the Earth to warm by trapping more heat. This is commonly referred to as the “Greenhouse effect” and these gases are typically referred to as “greenhouse gases” (GHGs).

In nature, $CO_2$ is exchanged continually between the atmosphere, plants, and animals through processes of photosynthesis, respiration, and decomposition, and between the atmosphere and oceans through gas exchange. Billions of tons of carbon in the form of $CO_2$ are annually absorbed by oceans and living biomass (also known as “sinks”) and are annually emitted to the atmosphere through natural and man-made processes (also called “sources”). When in equilibrium, carbon fluxes among these various global reservoirs are roughly balanced.

The most abundant man-made GHG is $CO_2$. The major anthropogenic emissions sources of $CO_2$ in the United States include combustion of fossil fuels (such as the coal); noncombustion of

fossil fuels in producing chemical feedstocks, solvents, lubricants, waxes, asphalt, and other materials; iron and steel production; cement production; and natural gas extraction and transportation systems. The major U.S. emission sources of methane are ruminant animals (cows and sheep), landfills, natural gas extraction and transportation systems, and coal mining. HFCs, PFCs, and SF6 are all industrial chemicals emitted by various industrial activities, there are no natural sources of these GHGs (Intergovernmental Panel on Climate Change 2013). GHGs are present in the atmosphere naturally, released by natural sources, or formed from secondary reactions taking place in the atmosphere. In the last 200 years, substantial quantities of GHGs have been released into the atmosphere by human activities. These extra emissions are increasing GHG concentrations in the atmosphere, enhancing the natural greenhouse effect, which is considered to be causing or contributing to global warming (Intergovernmental Panel on Climate Change 2013).

The primary GHG emitted by human activity is $CO_2$ produced by the combustion of coal and other fossil fuels. Coal- and gas-fired electric power plants and automobiles are major sources of $CO_2$ in the United States. In 2014, worldwide man-made annual $CO_2$ emissions were estimated at 36 billion tons, with sources within the United States responsible for 14 percent of this total (Le Quéré et al. 2013). According to the official U.S. Greenhouse Gas Inventory, electric utilities in the United States were estimated to emit 2.039 billion tons, roughly 32 percent of the U.S. total in 2012 (EPA 2014). In 2014, fossil-fired generation accounted for 52 percent of TVA's total electric generation, and the non-emitting sources of nuclear, hydro, and other renewables accounted for 48 percent. Compared to $CO_2$ emissions from the entire TVA system in 2005 to those in 2014, TVA has reduced its $CO_2$ emissions by about 30 percent and anticipates achieving a total $CO_2$ emission reduction of 40 percent by 2020.

### 3.11.2 Environmental Consequences

#### 3.11.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. GHG emissions would be associated with up to 13 truck trips over the course of two to three weeks to remove soil due to the closure and remediation of firing range 3. The total amount of GHG emissions associated with the completion and operation of the two nuclear units and the truck trips for firing range soil remediation would be minor and temporary in comparison to emissions from the surrounding area, and would not adversely affect global greenhouse gas levels. Therefore, there would be no impacts to climate change under Alternative A.

#### 3.11.2.2 Alternative B – Complete the Sale of the BLN Property

GHG emissions associated with construction activities and operations of the two nuclear units for this alternative relate to the emissions produced by equipment (primarily related to the combustion of gasoline and diesel fuels in vehicles, generators, and earth-moving equipment) and operational emissions from the plant (primarily from the cooling towers and onsite equipment). GHG emissions would also be associated with the up to 13 truck trips to remove soil associated with the closure and remediation of the firing ranges. The total amount of GHG

emissions associated with the completion and operation of the two nuclear units and the truck trips for firing range soil remediation would be minor and temporary in comparison to emissions from the surrounding area, and would not adversely affect global greenhouse gas levels. Therefore, completion and operations of the nuclear units on the BLN Property under this alternative would not result in impacts on climate change.

## 3.12 Noise

### 3.12.1 Affected Environment

At high levels, noise can cause hearing loss and at moderate levels noise can interfere with communication, disrupt sleep, and cause stress. Even at relatively low levels, noise can cause annoyance. Noise is measured in logarithmic units called decibels (dB), so an increase of 3 dB is just noticeable and an increase of 10 dB is perceived as a doubling of sound level. Given that the human ear cannot perceive all pitches or frequencies of sound, noise measurements are typically weighted to correspond to the limits of human hearing. This adjusted unit of measure is known as the A-weighted decibel (dBA). A-scale weighting reflects the fact that a human ear hears poorly in the lower octave-bands. It emphasizes the noise levels in the higher frequency bands heard more efficiently by the ear and discounts the lower frequency bands.

The equivalent sound level is the constant sound level that conveys the same sound energy as the actual varying instantaneous sounds over a given period. It averages the fluctuating noise heard over a specific period as if it had been a steady sound. The day-night sound level ($L_{dn}$) is the 24-hour average noise level with a 10-dBA penalty between 10 p.m. and 7 a.m. to account for the fact that most people are more sensitive to noise while they are sleeping.

Community noise impacts are typically judged based on the magnitude of the increase above existing sound levels. There are no federal, state, or local industrial noise statutes for the area surrounding the BLN Property. EPA guidelines recommend that $L_{dn}$ not exceed 55 dBA. The U.S. Department of Housing and Urban Development (HUD) considers areas with an upper limit of $L_{dn}$ of 65 dBA to be acceptable for residential development.

The BLN Property is located in a rural area along the Tennessee River (Guntersville Reservoir) in northeast Alabama. The nearest residences (primary homes, cabins, and secondary homes) are situated north of the BLN Property across Town Creek in the Creeks Edge development. The nearest home in this development is located approximately 0.75 miles from the Unit 1 steam generators and 0.66 miles from the Unit 1 cooling tower (the features of the BLN Property that would produce the highest levels of sustained noise during operations). Background ambient sound levels were measured in 2006 at the BLN Property fenceline with values ranging from 47 to 55 dBA which is typical of a rural community (TVA 2008). Noise sources in the vicinity of the BLN Property include barge traffic, road traffic, power boats, BLN plant equipment (fans, transformers, compressors), power line hum, wildlife/insects, and residential noise.

### 3.12.2 Environmental Consequences

#### 3.12.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. Under Alternative A, there would be increases in the ambient noise at the BLN Property in association with remediation of the soils at the firing ranges. These noise impacts would be temporary and would be consistent with existing noise at the BLN Property. As there would be no change in the ambient noise environment, no noise impacts would be anticipated.

#### 3.12.2.2 Alternative B – Complete the Sale of the BLN Property

Under Alternative B, there would be increases in the ambient noise at the BLN Property as a result of both construction and operation activities and in association with remediation of the soils at the firing ranges. While Nuclear Development intends to complete construction of the nuclear units and no extensive demolition is anticipated, because of the age of the existing structures and equipment, it is possible some demolition may occur. This could result in temporary sharp increases in both noise (exceeding 110 dBA) and vibration. Noise attenuates with distance. Vibration associated with demolition or impact activities (such as pile driving) can travel short distances depending on the nature of the event and the surrounding geological materials. TVA assumes Nuclear Development would comply with all applicable federal, state, and local regulations regarding construction demolition activities which could create significant noise or vibrations. It is assumed that while such noise and vibrations may be noticeable to residents in the vicinity, they would be temporary and minor impacts.

Other phases of construction would require the use of various construction equipment such as cranes, forklifts, compressors, backhoes, dump trucks, and welding machines. These types of equipment could generate noise levels from approximately 80 to 90 dbA at a distance of 50 feet. While construction could result in a noticeable increase above ambient noise levels at the nearest residence, it would be anticipated to be around the EPA's 55 dBA $L_{dn}$ recommendation and therefore would constitute a minor impact. It is assumed that the majority of construction activities would occur within daylight hours, and therefore would not impact nighttime ambient noise levels which are typically lower.

As described in the 2010 SEIS, the major operational noise sources at the BLN Property would be the cooling towers. Noise from the cooling towers would likely approach 85 dBA near each tower. The 2010 SEIS determined noise from a single operational tower would be reduced to approximately 55 dBA at 1,000 feet. Sound pressure levels are not additive, therefore the addition of a second cooling tower does not result in a doubling of the decibel levels. Though Nuclear Development has not finalized its plans for the BLN Property and the operational characteristics of the cooling towers, it can be assumed that noise associated with the operation of two cooling towers would not be significantly greater than the noise from a single operational tower, particularly with distance. At the nearest residence, noise from the cooling towers would be expected to be similar to background noise levels in the area. Noise levels associated with operations at the BLN Property would not be anticipated to exceed the U.S. Environmental

Protection Agencies recommendation or the U.S. Department of Housing and Urban Development guideline for residential areas. Based on the projected noise levels, noise impacts associated with operation of the BLN Property are expected to be minor to residents in the surrounding area, including the Creeks Edge development.

## 3.13 Hazardous Materials and Solid and Hazardous Waste

The earliest BLN NEPA document, TVA's 1974 FES, addressed expected solid waste generation resulting from plant construction, normal plant activities, and transmission line clearing and maintenance practices, and the proposed disposal of those wastes for two nuclear units at the BLN Property. While nominal changes in categories of wastes changed over time since that initial analysis, the general assemblage of the wastes remains the same.

"Domestic waste" was the largest type of nonradiological waste identified in the 1974 TVA FES. An exhaustive list of typical domestic waste is provided in the 1974 TVA FES and includes garbage, paper, plastic, packing materials (metal-retaining bands, excelsior, cardboard), leather, rubber, glass, soft drink and food cans, dead animals and fish, oil and air filters, floor sweepings, ashes, wood, textiles, and scrap metal.

Plant construction solid waste, such as metal, lumber scrap, and other salvageable material, would be collected periodically and either sold or removed from the site for disposal. Normal nonradiological solid wastes include sludge from water treatment plant filters and demineralizers, paper, soft drink cans, glass, wood, and to a lesser extent garbage. Scrap metals may be salvaged and sold. Scrap lumber may be salvaged and used or sold, or disposed of with other solid wastes. Disposal of domestic and construction related solid waste would occur at a permitted landfill in accordance with applicable regulations.

Nonradiological hazardous wastes are those that require special handling and/or disposal methods to avoid illness or injury to persons or damage to the environment. Examples of hazardous waste include empty containers from paints, solvents, pesticides, acids, oils, PCBs, chemical grouts, as well as the materials themselves. Problem wastes, as defined in the 1974 TVA FES, were those that are difficult to handle by conventional means. Examples of problem wastes were sludges from water and wastewater treatment plants, tires, materials from intake screens, and materials used in the cleanup of chemical or oil spills. It should be noted that the RCRA regulations (40 CFR Parts 260-273), the basis for current hazardous waste management, were not yet in force at the time of TVA's 1974 FES. The TVA white paper (TVA 1993a) was developed to determine if the 1974 FES needed to be supplemented when TVA proposed to change from deferred construction status. The 1993 white paper added asbestos materials to the list of wastes present at the BLN Property. Any hazardous wastes would be disposed of or treated offsite at state-approved treatment/disposal facilities.

As described in the 2010 SEIS, the 2008 COLA ER provided a description of the estimated solid waste generation associated with the completion and operation of two AP1000 units at the BLN Property, including a discussion on the types of solid waste and the quantities.

The changes in solid and hazardous waste generation at the BLN Property from the earlier NEPA review conditions reflect changes primarily in the quantitative distribution of wastes rather than changes in the types of wastes. Currently, with the plant in deferred status, the solid waste generated is minimal, commensurate with the low level of activity at the plant. Typical solid waste is routinely put in dumpsters on the site and subsequently disposed of offsite in an approved sanitary landfill. Other nonhazardous solid waste generated at the BLN Property such as used oil, oily water, grease, etc. is typically drummed prior to disposal or recycling.

As with solid waste, the hazardous waste generated at the BLN Property is minimal, again commensurate with the reduced level of activity at the plant. The BLN Property is a conditionally exempt small quantity generator (CESQG). A CESQG generates hazardous waste at a rate of less than 100 kg (220 pounds) in any calendar month and manages the waste in a manner specified by the EPA (40 CFR § 261.5). Such hazardous wastes include paints, paint-related materials, solvents, corrosive liquids, aerosol cans, discarded chemicals, and broken florescent bulbs. Drummed PCB ballasts are considered toxic rather than hazardous in terms of the regulations. Currently, TVA manages a number of waste management contracts that provide TVA with a variety of hazardous waste disposal options approved by regulators.

An asbestos landfill is present on the BLN Property. The landfill is no longer operational though is maintained with land use controls and signage. This landfill would remain undisturbed on the BLN Property under any of the project alternatives.

### 3.13.1 Affected Environment

### 3.13.2 Environmental Consequences

#### 3.13.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the “as-is” condition and the site would continue to be secured and monitored. As there would be no change in site activities, there would be no change in the generation of hazardous materials and solid and hazardous wastes at the BLN Property. Therefore, there would be no impacts associated with hazardous materials and solid and hazardous waste.

Historical and continued use of lead shot and bullets at the three outdoor firing ranges presents a waste remediation consideration at the BLN Property. Lead shot may break down into soluble lead compounds, such as lead hydroxide, and lead oxide, which may migrate into the groundwater and/or surface water. This soluble lead could pose a potential threat to human health and the environment through water contamination. Lead shot is not considered a hazardous waste subject to RCRA at the time it is discharged from a firearm because it is used for its intended purpose. As such, a RCRA permit is not required to operate a shooting range. However, spent lead shot and bullets are subject to the broader definition of solid waste and are potentially subject to RCRA. Lead, if recycled or reused, is considered a scrap metal and is excluded from RCRA. Lead shot removal and recycling, soil removal, and implementation of other practices minimize contamination of the ranges and potential impacts to human health and the environment.

TVA plans to use best management practices as described in EPA's *Best Management Practices for Lead at Outdoor Shooting Ranges* manual (2005) to manage the three firing ranges on the BLN Property. TVA conducted soil sampling to determine whether any quantities of lead were present in the soil of the three ranges. The sampling results at inactive range 2 indicate that total lead concentration in the soil is below the USEPA RSL for residential soils; therefore, no remediation activities are necessary. TVA would post signage notifying that range 2 is closed and no shooting activities should occur at range 2. Two of the eight sampling results collected from inactive range 3 had total lead concentrations above the USEPA RSL for industrial soils. These higher results came from the left upper and lower sections of the berm. However, TVA would remove the entire 225 cubic yards of soil that make up the berm located at range 3. TVA would comply with applicable federal, state, and local requirements for disposing of the soil. TVA would post signage notifying that range 3 is closed and no shooting activities should occur at range 3. These activities would remediate the soils to an acceptable industrial level. Therefore, any solid and hazardous waste impacts associated with the inactive ranges would be minor.

The sampling results at the active range (range 1) indicate that total lead concentration in the soil is below the USEPA RSL for residential soils. TVA would consider, as needed, the following best management practices for active shooting range 1 to minimize the impact of lead on the environment:

- Prevent lead migration:
    - Monitoring and adjusting soil pH (such as with lime spreading)
    - Immobilizing lead (such as with phosphate spreading)
    - Controlling stormwater runoff from the firing range
- Remove and recycle
    - Hand raking and sifting
    - Screening
    - Vacuuming
    - Soil washing
- Bullet containment (through the existing earthen backstop and/or with sand traps, steel traps, lamella or rubber granule traps, and shock absorbing concrete) and shot containment by reducing shortfall zones.
- Documentation and record keeping
    - Documenting the number of rounds fired/shot size
    - Documenting best management practices used at ranges to control migration
    - Documenting date and provider of services
    - Keeping records for the life of the range and at least 10 years after closing
    - Routinely evaluating the effectiveness of best management practices used

With implementation of best management practices associated with continued use of the existing firing range, no impacts to human health and the environment associated with lead shot at the range would be anticipated.

#### 3.13.2.2 Alternative B – Complete the Sale of the BLN Property

It is assumed that similar solid and hazardous wastes as described in the 1974 FES and subsequent environmental analyses would be generated by Nuclear Development during completion of the BLN Property and then subsequently during operations. The quantities of hazardous materials and solid and hazardous wastes generated by Nuclear Development would be higher than the amounts currently generated at the BLN Property. The quantities and types of solid waste generated during construction phase would be determined by the construction plan and the equipment that must be taken out and/or replaced or added. Any construction/demolition wastes would be managed in accordance to all relevant federal, state, and local regulations and disposed of in appropriate, permitted facilities. It is assumed some wastes may be recycled.

Types of hazardous wastes typically generated by TVA nuclear plants include paint, paint thinners, paint solids, discarded laboratory chemicals, spent fixer (X-ray solution), parts washer liquid, hydrazine, rags from hydrazine cleanup, sulfuric acid and sodium hydroxide waste from demineralizer beds and makeup water treatment, and broken florescent bulbs. These operating plants tend to be EPA hazardous waste small quantity generators (SQGs) in that they generate between 100 kg and 1,000 kg of hazardous waste per calendar month. During outages, these plants may temporarily become EPA hazardous waste large quantity generators producing greater than 1,000 kg per month for the period of the outage. The operating TVA nuclear plants providing these generation rates are multiunit plants; therefore, it is assumed operation of the nuclear units at the BLN Property would generate a similar quantity of hazardous materials.

Because the disposal of the solid and hazardous wastes from completing construction and operation would be in accordance with applicable regulations and at permitted facilities with adequate capacity to serve the BLN Property needs, any adverse effects from the generation, management, and disposal of these wastes are likely to be small.

As described in Subsection 3.13.2.1, no remediation would be required at inactive range 2 and TVA would use best management practices to remediate inactive range 3. TVA would comply with applicable federal, state, and local requirements for disposing of the soil from range 3. TVA would also post signage notifying that ranges 2 and 3 are closed and no shooting activities should occur at either location. As the soils at range 3 would be remediated to an acceptable industrial level, any solid and hazardous waste impacts associated with the inactive ranges would be minor.

The sampling results at the active range (range 1) indicate that total lead concentration in the soil is below the USEPA RSL for residential soils. Nuclear Development has expressed interest in continuing to utilize the active firing range. TVA assumes that Nuclear Development would utilize the best management practices similar to those described in Subsection 3.13.2.1 with respect to the active firing range and would comply with local, state, and federal laws and regulations. With implementation of best management practices associated with continued use of the existing firing range and compliance with laws and regulations, no impacts to human health and the environment associated with lead shot at the range would be anticipated.

## 3.14 Transportation

### 3.14.1 Affected Environment

Within Jackson County, Alabama, the one federal highway, US-72, runs east across the county into the City of Scottsboro, Alabama, then northeast through the town of Hollywood, Alabama, into the State of Tennessee. The closest major road to the BLN Property, US-72, is a four-lane divided highway that connects the BLN Property to Interstate 24 in Marion County, Tennessee and to Interstate 565 in Madison County, Alabama. Numerous state routes traverse the county, providing rural areas access to the larger populated areas. A small service exists in Jackson County, transporting residents from rural portions of the county into Scottsboro for shopping.

Vehicle volume on roads, obtained from estimated Average Annual Daily Traffic (AADT) counts from the Alabama Department of Transportation, reflects the urban and rural traffic characteristics of the county (Alabama Department of Transportation 2015a). The 2015 AADT counts for US-72 in the vicinity of the BLN Property are shown in Figure 3.14-1.

These counts show an increase in traffic along roadways in the vicinity of the BLN Property as compared to the counts reported in the 2010 SEIS.

TVA is unaware of any planned road modification projects on the roadways adjacent to the BLN Property. Several road construction projects have been planned and/or completed in Jackson County. The closest of these projects, widening of State Route (SR) 35, would occur across the Tennessee River (Guntersville Reservoir) south of the BLN Property. Additionally there would be a bridge replacement on SR-35 over Roseberry Creek. These projects are scheduled for completion by 2019 (Alabama Department of Transportation 2015b).

Construction workers and truck deliveries would access the site via US-72 and County Road 33. Operations workers and security personnel are expected to access the site during construction and operations using US-72 and Bellefonte Road.

### 3.14.2 Environmental Consequences

#### 3.14.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the “as-is” condition and the site would continue to be secured and monitored. Closure of the two former firing ranges on the BLN Property could result in approximately 13 truck trips hauling approximately 225 cubic yards of soil from the BLN Property to a permitted offsite disposal facility. These truck trips would add traffic to the routes between the BLN Property and the disposal locations. The disposal locations are unknown at present. The trucks would primarily travel along major roadways such as highways and interstates. Travel along minor roadways would typically occur only over short distances or in the event of detours. The contribution of up to 13 truck trips from the BLN Property to the disposal facilities would occur over the course of two to three weeks. Overall the additional traffic would be distributed over time, over distance, and along roadways that experience thousands of vehicle trips per day. Therefore, no impacts to transportation under Alternative A would be expected.

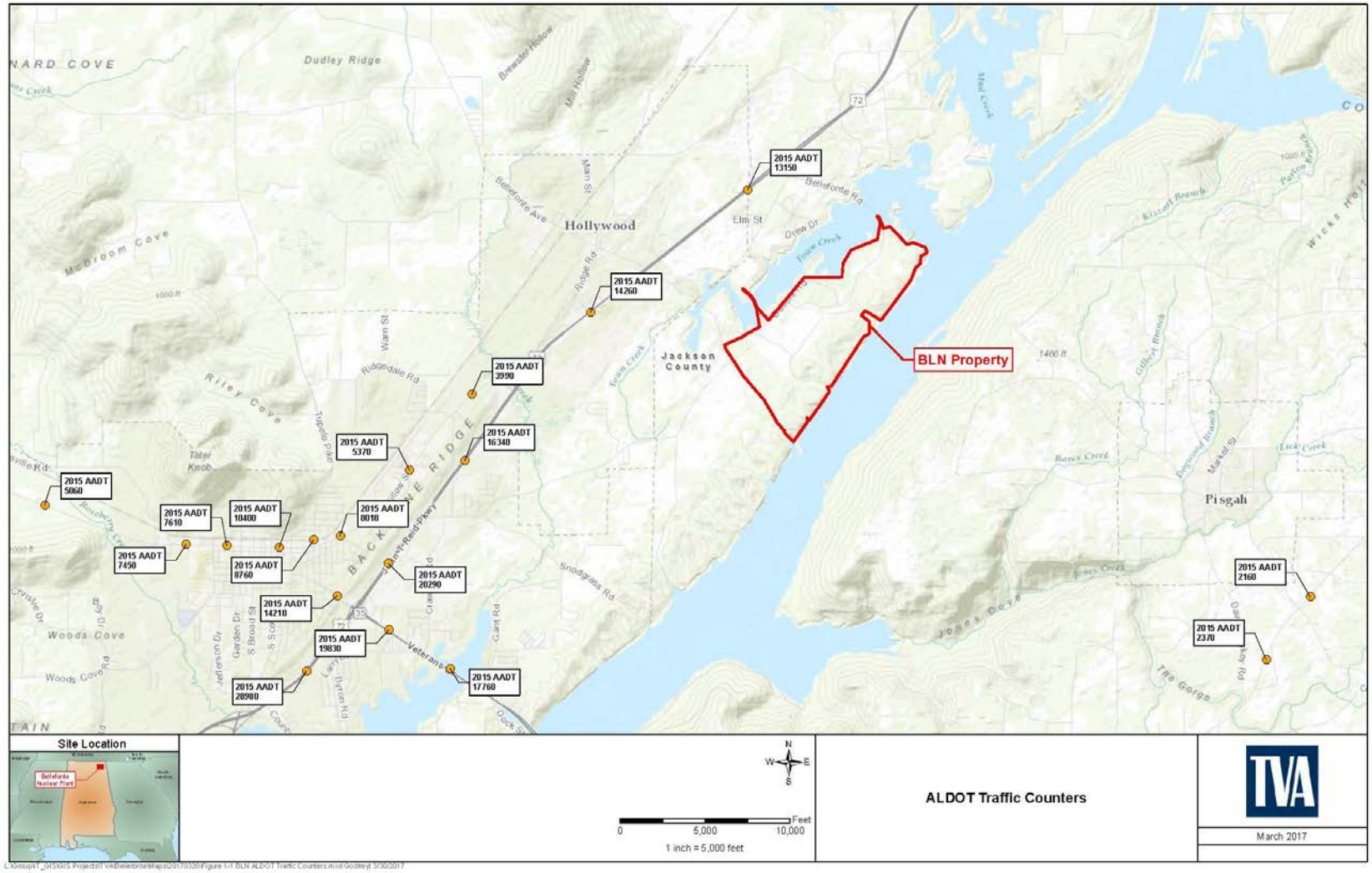


**Figure 3.14-1. 2015 Average Annual Daily Traffic (AADT) Counts in the BLN Property Vicinity**

#### 3.14.2.2 Alternative B – Complete the Sale of the BLN Property

Under Alternative B, traffic at the BLN Property would be expected to increase both as a result of completion of construction and operations. Impacts on traffic are determined by (1) the number of construction and operations workers and their vehicles on the roads, (2) the number of shift changes for the workforce, (3) projected population growth in the region, and (4) the capacity of the roads. The 2010 SEIS and 2008 COLA ER analyzed the impacts associated with a workforce of approximately 3,900 workers requiring access to the BLN Property during construction. Additionally, construction vehicles and shipments of construction equipment and materials would result in increases on the roadways in the vicinity. Nuclear Development's plans for the BLN Property, and therefore the peak construction workforce numbers are not currently known. It can be assumed that the construction workforce required for completion of the nuclear units at the BLN Property would not exceed the workforce required for construction of new reactors. Based on the available information, TVA assumes the estimated construction workforce of approximately 3,900 required for completion of two nuclear units onsite as evaluated in both the 2010 SEIS and the 2008 COLA ER represents an acceptable estimate for Nuclear Development's action. TVA estimates approximately 800 workers would be required during plant operations.

As a result of the increased traffic during construction, particularly during shift changes, some congestion and delays could occur. As described in the 2010 SEIS, increased traffic during construction would be expected to affect primarily US-72 and the access roads leading from the highway to the plant, including County Road 33.

County Road 33 from US-72 to the south plant entrance is expected to serve as the primary access route for plant traffic. TVA conducted a transportation study in 2011 to evaluate site access and provide recommendations for improving operations and safety of the roadway. This analysis evaluated the impacts for an estimated 3,900 construction workers, similar to the assumed peak workforce for Nuclear Development's actions at the BLN Property. TVA estimates about 60 percent of total site traffic would come from and go to the west via the intersection of County Road 33 and US-72, while ten percent would come from and go to the southwest via County Road 33 in the opposite direction. Thirty percent of the traffic would use the north gate at Bellefonte Road to go to and from the east via US-72.

The 2011 transportation study evaluated the impacts to traffic in the BLN Property vicinity based on existing data and estimates of future conditions. The study found that the addition of up to 3,900 construction workers and their vehicles would decrease the level of service along Bellefonte Road, County Road 33 and US-72 because of traffic congestion. A number of mitigation measures were proposed to improve future service levels including:

- Upgrading the existing stop control for minor roadway approaches to the US-72 County Road 33 intersection to a semi-actuated traffic signal based on existing 4 hour and peak hour volumes of traffic.
- Adding flashing beacons to the US-72 approaches to warn motorists approaching the traffic signal

- The through lane in the middle of the northbound approach of County Road 33 to US-72 could be reassigned to be left and through. This would provide a dual left turn lane similar to the two departure lanes available on US-72 westbound. The timing and phasing of the traffic signal would likely require modification to reflect the two turn lanes so they operate in protected mode only.
- The channelized right turn lane of County Road 33 to US-72 could be extended to 75 feet in length and the left turn lane extended to 220 feet in length to provide adequate storage.
- A second southbound lane could be added to County Road 33 between US-72 and the proposed new BLN Property access road. This lane may need to be extended further south to provide sufficient weaving distance for traffic depending on the final estimated volumes for the morning peak hours. A channelized right turn lane with at least 75 feet of storage length could be provided at the access road intersection.
- Unless an aggressive traffic demand management plan such as shuttle busses is adopted, the westbound left turn lane of US-72 at County Road 33 may need to be extended 115 feet to provide additional storage during the construction period.
- A channelized right turn land with at least 75 feet of storage could be added to the northbound approach of Bellefonte Road to US-72.
- A temporary traffic control plan for construction traffic could be developed in cooperation with the Alabama Department of Transportation to accommodate the increase in truck traffic related to the construction activities. Orange signage designating the presence of truck traffic as permitted by the Uniform Manual on Traffic Control Devices could be installed on US-72, County Road 33, County Road 558, and County Road 113. Application to the Department of Transportation for placing variable message signing boards mounted on trailers in the median of US-72 could also be made; these boards would warn drivers of the presence of trucks turning onto or from the side roads as well as provide timely information on road closures or other events.
- A way-finding plan for the BLN Property could be developed in consultation with the Department of Transportation in advance of construction operations. This plan could include web-based real-time information on routes (with GPS linkage) as well as physical information signs where allowed by state or local authorities. Nuclear Development could also request the Department of Transportation consider street-ahead signage (either as green guide signs or yellow warning signs with street name plaques) advising drivers as they are approaching Bellefonte Road.

Though traffic generated by construction activities could strain the local road network, it is anticipated the principal effects would be temporary occurring only during the peak construction period and that with implementation of the mitigation measures described above (or similar measures) these impacts would be minor. Any roadway changes would need to be coordinated with Alabama Department of Transportation (ALDOT). Impacts on other transportation corridors associated with the construction period workforce and deliveries are considered minor.

The 2010 SEIS also identified design elements of County Road 33 that included horizontal curvature, vertical curvature, stopping sigh distance, shoulder widths and side slopes, lane widths, and pavement markings and signage. Recommended improvements were limited to activities which could be accomplished within the existing ROW and would be expected to have no significant environmental impacts. These recommendations included:

- Clear vegetation from roadsides to a minimum distance of 10 feet, preferably 15 feet from the edge of pavement, including overhanging branches;
- Mill and overlay the existing pavement, add centerline and edge striping and reflective pavement markers along centerline;
- Add advisory speed plaques (30 MPH) to Winding Road and Curve Ahead signs;
- Widen shoulders and re-grade roadside ditches which have excessive depth (> 3 feet). Provided a minimum 2-foot, preferably 4-foot aggregate surface shoulder with maximum 3:1, preferably 4:1, fill slopes. Re-grade ditches to provide a 2- to 3-foot depth below the shoulder elevation;
- Extend the box culvert to provide a minimum 4 foot shoulder area with guardrail;
- Remove large trees and utility poles within 10 feet of the edge of pavement;
- Clear vegetation south of the existing plant entrance and east of County Road 33 to a distance of 35 to 40 feet from the edge of the pavement to provide intersection sight distance to the south;
- If the south plant entrance is relocated to the south of its existing location, widen County Road 33 to provide 11 foot lanes to the new plant entrance.

These minor improvements to County Road 33 would likely be sufficient to minimize any impacts related to operations traffic at the BLN Property.

It is assumed Nuclear Development would be required to conduct a transportation analysis as part of the NRC permitting process. Similar to the 2011 traffic study, Nuclear Development's transportation analysis would likely collect baseline vehicle traffic data from County Road 33, US-72, and Bellefonte Road to determine the current use rates of these roads. Nuclear Development would likely also analyze projected future usage of these roads in conjunction with the estimated peak workforce to determine the mitigation measures required to minimize potential effects.

Nuclear Development could also utilize barges to transport construction equipment and materials to the BLN Property. Additionally, a railroad parallels US-72. An old rail spur previously entered the BLN Property. This spur, which is included in the property sale, is currently inactive. Repairs would be required for future use of the spur, but Nuclear Development could elect to refurbish it for shipment of equipment during construction.

Plant operations would also result in an increase in traffic to and from the BLN Property over and above the current conditions. However, the effects of commuter traffic during operations

would be less than during construction activities, especially compared to peak construction. Any mitigation effects applied for the construction activities would only improve capacity levels during the operational phase. Operational impacts to transportation are, therefore, anticipated to be minor.

Closure of the two former firing ranges on the BLN Property could result in approximately 13 truck trips hauling approximately 225 cubic yards of soil from the BLN Property to a permitted offsite disposal facility. These truck trips would add traffic to the routes between the BLN Property and the disposal locations. The disposal locations are unknown at present. The trucks would primarily travel along major roadways such as highways and interstates. Travel along minor roadways would typically occur only over short distances or in the event of detours. The contribution of up to 13 truck trips from the BLN Property to the disposal facilities would occur over the course of two to three weeks. Overall the additional traffic would be distributed over time, over distance, and along roadways that experience thousands of vehicle trips per day. Therefore, no impacts to transportation as a result of closure and remediation of the firing ranges at BLN under Alternative B would be expected.

## 3.15 Natural Areas, Parks, and Recreation

### 3.15.1 Affected Environment

*Regional Outdoor Recreation Resources*

As documented in previous reviews associated with the BLN reservation, recreation resources within a 50 mile radius of the BLN Property include major parks and recreation resources such as Chattahoochee National Forest, Wheeler National Wildlife Refuge, Little River Canyon National Preserve, and several state parks. Guntersville Reservoir is also a significant regional recreation resource with over 80 developed public, commercial, and quasi-public recreation areas. The waters and adjacent shoreline of this 69,000-acre reservoir receive heavy recreation use including boating, fishing, swimming, camping, hiking, and hunting.

*Recreation Facilities within 6 miles of the BLN Property*

Most of the developed recreation areas on Guntersville are concentrated on the lower end of the reservoir and are well removed from the BLN Property. However, there are six developed recreation facilities located within 6 miles of the BLN Reservation as well as one that is located on the TVA property.

The six areas located in the general vicinity of the plant property include four public boat launching ramps managed by the State of Alabama, one commercial recreation operation, and a group camp facility. All of these areas are located a minimum of 4 miles from the BLN Reservation.

*Recreational facilities and activities on BLN Property*

A small public boat launching ramp with parking for approximately eight vehicles with trailers has been developed by TVA on the south bank of the Town Creek embayment just off Bellefonte Road. This facility is not included in the sale. TVA is considering disposing of this

property under a separate action. The boat ramp would continue to be available for public use regardless of future disposition. Some dispersed water based recreational activity such as boating, fishing, and swimming also occurs along the shoreline of the plant property.

### 3.15.2 Environmental Consequences

#### 3.15.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. There would be no impacts to natural areas, parks, and recreation.

#### 3.15.2.2 Alternative B – Complete the Sale of the BLN Property

Under Alternative B, it is anticipated that construction activities would be limited to the BLN Property and primarily to already disturbed areas on the site. Operational activities would also be limited to the BLN Property. Some construction activities may generate noise or fugitive dust that may be an annoyance to recreationists in the vicinity of the plant site. Such noise levels would occur over a short period of time and impacts would be minor. Possibly objectionable operational noise would not be anticipated to be experienced beyond the site boundary. Changes in river levels affected by operational plant water use would not be expected to impact recreational boating, even during extreme low-flow conditions (TVA 2008). Increases in the numbers of workers in the vicinity of the site could result in increases in the number of visitors/users of the natural areas, parks, and recreation areas in the vicinity. This could result in greater congestion at these locations and possibly impact visitor experiences. Overall, these increases would be anticipated to be distributed across the various natural areas, parks, and recreation areas in the vicinity. Thus, significant increases in attendance at any one location would occur only on periodic occasions throughout both construction and operations. While overall the numbers of recreational users would increase, individual impacts related to high levels of users would be temporary in individual duration. Though TVA would retain the shoreline around the majority of the BLN Property, the shoreline would be likely within the Exclusion Area Boundary for the completed plant and could be subject to access restrictions in an emergency. Impacts to recreational uses of the shoreline in this area as a result of emergency restrictions would be rare and temporary, and therefore, minor.

## 3.16 Cultural and Historic Resources

### 3.16.1 Affected Environment

Under Section 106 of the National Historic Preservation Act, defined at 36 CFR § 800.16(d), a project's Area of Potential Effects (APE) is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." TVA has defined the project APE for archaeological resources as the approximately 1,400 acre BLN Property that TVA would transfer to Nuclear Development.

From a cultural resources perspective, lands within the BLN Property can be divided into two main groups: (1) developed lands (such as two partially constructed nuclear reactors and associated facilities including cooling towers, cooling water intake, office buildings, warehouses, laydown areas, a training center, parking lots, roads, railroad spurs, and 500-kV and 161-kV switchyards); and (2) undeveloped lands (hardwood trees, lawns and grassy fields, scrub-shrub thickets, bottom land/riparian hardwoods, and pine hardwood forests). The developed lands have little or no potential to contain intact archaeological sites that could be eligible for inclusion in the National Register of Historic Places (NRHP) due to the disturbance from development. The undeveloped lands have some potential to contain such sites. TVA has previously conducted archaeological surveys (Oakley 1972, Deter-Wolf 2007, Gaffin 2011) within approximately 600 acres of the BLN Reservation. Approximately 743 acres of land within the BLN Reservation either consists of developed land or is undeveloped land that was included in a previous archaeological survey. The remaining approximately 853 acres within the reservation consists of undeveloped land that had not previously been surveyed by archaeologists. In 2016, TVA conducted a Phase I cultural resources survey of this 853-acre portion of the APE in order to identify any historic properties that may be impacted by the undertaking.

Background research conducted prior to the 2016 survey indicated that 14 archaeological sites had been recorded within, or in close proximity to, the APE. However, only four of these sites, 1JA113, 1JA302, 1JA978, and 1JA1149 are located within the current APE. The 2016 survey identified and evaluated 10 new archaeological sites (1JA1182 – 1JA1191), one historic cemetery (Fennell Cemetery), and one isolated find (IF-1). Additionally, four previously recorded archaeological sites, 1JA113, 1JA302, 1JA978 and 1JA1149 were revisited and reevaluated. The 10 newly identified archaeological sites consisted of lithic scatters of prehistoric artifacts of unknown age and/or late nineteenth to early twentieth century historic artifacts. Sites 1JA1182 – 1JA1188 are historic residence/farmsteads/debris piles dating from the late nineteenth century into the twentieth century. Site 1JA1189 is a prehistoric artifact scatter. Sites 1JA1190 and 1JA1191 are prehistoric lithic scatters. Fennell Cemetery is an early nineteenth century cemetery. The precise ages of previously recorded archaeological sites (1JA113, 1JA302, 1JA978, and 1JA1149) are unknown, but all these sites pre-date the historic period.

TVA determined that sites 1JA1149 and 1JA1182 through 1JA1191 are ineligible for inclusion in the NRHP due a lack of potential to provide information important to the past. Previously recorded sites 1JA113 and 1JA978 were not found during the field investigations and it was determined that these sites have either been destroyed since they were first identified or were originally mapped incorrectly. The isolated find (IF-1) is ineligible for inclusion in the NRHP. In February 2017, the State Historic Preservation Officer concurred with TVA's findings.

The Fennell Cemetery is considered ineligible for listing on the NRHP but is nevertheless considered an important cultural resource. TVA conducted a ground-penetrating radar survey to search for unmarked graves and determine the extents of Fennell Cemetery. A fence buffer was established around the cemetery. TVA has informed the State Historic Preservation Officer regarding the completion of the survey.

### 3.16.2 Environmental Consequences

#### 3.16.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. To avoid any effects on the Fennell Cemetery, TVA will establish a sensitive area boundary surrounding the cemetery and prohibit any ground-disturbing activities within the cemetery. The sensitive area boundary will be based on TVA's estimate of the horizontal extent of the cemetery from the ground-penetrating radar survey. TVA anticipates there would be no effects to archaeological resources or the Fennell Cemetery as a result of the No Action Alternative.

#### 3.16.2.2 Alternative B – Complete the Sale of the BLN Property

As there are no known NRHP-listed or eligible archaeological or historic resources located in the BLN Property, no impacts would be anticipated. In February 2017, the State Historic Preservation Officer concurred with TVA's findings of no effects to cultural resources with respect to the proposed actions (Appendix A). TVA assumes that should any previously unknown cultural resources be discovered at the BLN Property in the future, Nuclear Development would comply with applicable federal, state, and local regulations regarding handling and treatment of those resources.

To avoid any project effects on the Fennell Cemetery, TVA will establish a sensitive area boundary surrounding the cemetery and will include a deed covenant in the sale documents prohibiting Nuclear Development from any ground-disturbing activities within the cemetery. The sensitive area boundary will be based on TVA's estimate of the horizontal extent of the cemetery from the ground-penetrating radar survey. TVA anticipates there would be no effects to archaeological resources or the Fennell Cemetery as a result of Alternative B.

## 3.17 Seismology

### 3.17.1 Affected Environment

TVA's 1974 FES describes the maximum historical Modified Mercalli Intensity (MMI, a scale of earthquake effects that ranges from Roman numeral I through XII) experienced at the BLN Property from nearby earthquakes. Section 2.5 of the 1986 FSAR (TVA 1986) describes the geology and seismicity in the vicinity of the BLN Property and contains a summary of significant regional earthquakes through 1973. The seismic history of the region around the BLN reservation from 1974 through January 2005 is contained in Appendix 2AA of the 2008 COLA FSAR. Table 3-12 of TVA's 2010 SEIS lists the seismic history from February 2005 through December 2008 for earthquakes within 200 miles of the BLN Property having magnitudes of 2.5 or greater based on the earthquake catalog maintained by the Advanced National Seismic System (ANSS) 2010. Table 3.17-1 lists the most recent seismic history within 200 miles of the BLN Property.

**Table 3.17-1. Earthquakes Within 200 Miles of the BLN Property (Jan 2009-Dec 2016)**

| Date | Time | Latitude | Longitude | Depth (km) | Magnitude | Magnitude Type |
|---|---|---|---|---|---|---|
| 1/27/2009 | 20:12.7 | 36.7733 | -84.1312 | 26.08 | 3.2 | Md |
| 1/30/2009 | 32:38.2 | 33.663 | -87.351 | 1 | 2.9 | ML |
| 3/14/2009 | 16:18.6 | 35.4437 | -84.1273 | 21.31 | 2.6 | Md |
| 3/16/2009 | 16:29.9 | 33.689 | -87.284 | 1 | 2.9 | ML |
| 3/17/2009 | 27:55.2 | 33.7452 | -86.2112 | 7.5 | 2.5 | Md |
| 4/4/2009 | 45:33.7 | 33.2147 | -83.2023 | 0 | 3.1 | Md |
| 4/21/2009 | 25:42.5 | 32.83 | -87.1 | 12.7 | 3.3 | Mw |
| 4/22/2009 | 28:29.0 | 32.809 | -87.103 | 8.2 | 2.9 | ML |
| 5/23/2009 | 03:31.3 | 35.5923 | -84.1563 | 7.81 | 2.7 | Md |
| 8/1/2009 | 38:26.1 | 35.0635 | -84.2923 | 5.4 | 3.2 | Md |
| 8/31/2009 | 07:10.2 | 35.778 | -84.1238 | 14.25 | 3.3 | Md |
| 10/2/2009 | 28:47.1 | 36.0482 | -83.5668 | 14.5 | 2.5 | Md |
| 10/3/2009 | 44:19.6 | 35.3008 | -82.4968 | 5.65 | 2.5 | Md |
| 10/27/2009 | 13:21.0 | 33.796 | -87.29 | 1 | 2.9 | ML |
| 11/1/2009 | 01:26.3 | 35.1368 | -84.8543 | 24.51 | 3 | Md |
| 11/6/2009 | 30:10.4 | 33.748 | -87.158 | 1 | 2.5 | ML |
| 1/5/2010 | 20:21.2 | 34.7072 | -85.2852 | 5.15 | 2.6 | Md |
| 1/5/2010 | 24:25.0 | 33.703 | -87.37 | 1 | 2.9 | ML |
| 4/20/2010 | 28:20.0 | 35.7252 | -84.001 | 2.24 | 3.3 | Md |
| 4/22/2010 | 14:55.6 | 35.7352 | -84.002 | 1.67 | 2.6 | Md |
| 5/6/2010 | 04:54.5 | 34.187 | -85.948 | 5 | 3.2 | ML |
| 6/11/2010 | 40:37.9 | 33.764 | -87.167 | 1 | 2.9 | ML |
| 10/29/2010 | 23:47.5 | 33.77 | -87.289 | 1 | 2.9 | ML |
| 1/2/2011 | 34:34.2 | 35.533 | -83.3837 | 3.8 | 2.5 | Md |
| 3/19/2011 | 00:56.4 | 34.8353 | -86.378 | 9.69 | 2.5 | Md |
| 4/24/2011 | 09:16.8 | 35.5788 | -85.0003 | 18.56 | 2.5 | Md |
| 8/14/2011 | 53:50.6 | 35.8982 | -84.4313 | 9.76 | 2.6 | Md |
| 9/13/2011 | 59:23.6 | 33.56 | -86.554 | 19.2 | 3 | ML |
| 9/14/2011 | 45:22.0 | 33.62 | -86.611 | 10.6 | 2.6 | Mc |
| 9/14/2011 | 50:55.0 | 33.598 | -86.566 | 11.2 | 2.5 | Mc |
| 11/9/2011 | 44:34.4 | 34.7727 | -84.982 | 5.16 | 2.7 | Md |
| 1/5/2012 | 00:49.4 | 33.7823 | -87.4825 | 7.5 | 2.9 | Md |
| 6/17/2012 | 39:38.2 | 35.171 | -85.373 | 18.3 | 2.5 | Mc |
| 7/15/2012 | 02:24.7 | 36.2033 | -83.736 | 4.32 | 2.6 | Md |
| 10/13/2012 | 03:08.5 | 34.9705 | -84.353 | 7.94 | 2.5 | Md |
| 11/19/2012 | 20:10.3 | 33.69 | -87.293 | 1 | 2.6 | ML |
| 11/24/2012 | 03:13.5 | 35.9187 | -83.5012 | 7.02 | 3 | Md |
| 11/24/2012 | 56:04.8 | 35.9128 | -83.4973 | 8.8 | 2.5 | Md |
| 12/5/2012 | 02:57.1 | 35.7025 | -84.1543 | 19.9 | 2.5 | Md |
| 2/2/2013 | 47:03.4 | 34.9633 | -84.9325 | 9.62 | 2.5 | Md |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3/1/2013 | 53:27.8 | 33.717 | -87.296 | 4.9 | 2.7 | ML |
| 3/2/2013 | 29:41.2 | 33.741 | -87.416 | 5 | 2.8 | ML |
| 4/18/2013 | 06:17.8 | 35.5595 | -85.0765 | 21.71 | 2.5 | Md |
| 5/10/2013 | 57:23.7 | 35.759 | -83.9113 | 21.66 | 2.5 | Md |
| 6/6/2013 | 58:14.6 | 35.2868 | -83.31 | 6.96 | 2.5 | Md |
| 6/6/2013 | 21:30.3 | 35.2895 | -83.3133 | 4.69 | 2.5 | Md |
| 6/22/2013 | 38:53.2 | 33.621 | -87.178 | 0 | 2.6 | ML |
| 6/30/2013 | 57:21.3 | 35.4007 | -84.4068 | 23.21 | 2.5 | Md |
| 8/13/2013 | 08:32.3 | 34.9587 | -84.9797 | 7.96 | 2.5 | Md |
| 9/24/2013 | 39:46.6 | 33.69 | -87.313 | 0 | 2.8 | Mb |
| 12/10/2013 | 49:31.0 | 34.9947 | -84.8118 | 8.43 | 2.8 | Md |
| 3/2/2014 | 30:50.4 | 35.5948 | -85.388 | 18.4 | 2.5 | Md |
| 3/6/2014 | 29:37.0 | 35.6807 | -84.2607 | 20.95 | 2.6 | Md |
| 4/13/2014 | 34:00.6 | 35.4487 | -84.4665 | 13.88 | 2.8 | Md |
| 4/21/2014 | 05:07.0 | 35.555 | -84.1578 | 11.72 | 2.8 | Md |
| 6/8/2014 | 12:04.9 | 35.5303 | -85.0898 | 13.76 | 2.8 | Md |
| 9/20/2014 | 54:00.2 | 35.6365 | -84.4243 | 13.93 | 2.5 | Md |
| 9/27/2014 | 45:53.1 | 33.3724 | -87.2212 | 0 | 2.9 | Mb |
| 11/8/2014 | 06:12.8 | 36.351 | -84.9947 | 20.6 | 2.5 | Md |
| 11/20/2014 | 25:31.5 | 32.9411 | -88.0317 | 5 | 3.8 | Mw |
| 11/22/2014 | 19:12.8 | 34.8808 | -84.8988 | 8.14 | 2.5 | Md |
| 12/17/2014 | 38:15.6 | 32.9504 | -88.0198 | 9.17 | 3.4 | Mb |
| 1/22/2015 | 01:23.0 | 33.011 | -88.0207 | 2.89 | 2.7 | Md |
| 2/19/2015 | 19:09.4 | 32.9083 | -87.9971 | 4.63 | 3 | Mb |
| 2/19/2015 | 29:43.6 | 32.9497 | -88.0307 | 2.95 | 3 | Mb |
| 2/27/2015 | 40:50.1 | 33.0093 | -88.0412 | 19.58 | 3.2 | Md |
| 3/8/2015 | 35:01.1 | 36.6697 | -84.1178 | 8.56 | 2.8 | Md |
| 3/12/2015 | 19:20.1 | 32.9718 | -88.055 | 0 | 3.1 | Mb |
| 3/12/2015 | 14:02.5 | 35.4588 | -83.2828 | 0.03 | 2.5 | Md |
| 3/14/2015 | 51:28.8 | 35.4547 | -83.2798 | 0.11 | 2.8 | Md |
| 3/26/2015 | 21:10.0 | 35.5628 | -84.659 | 16.61 | 2.8 | Md |
| 4/9/2015 | 02:51.9 | 35.6608 | -83.6153 | 3.97 | 2.6 | Md |
| 4/11/2015 | 49:47.3 | 35.495 | -84.9895 | 13.55 | 2.6 | Md |
| 5/9/2015 | 19:38.6 | 35.0143 | -85.1795 | 10.64 | 2.5 | Md |
| 6/6/2015 | 09:35.0 | 32.9347 | -88.0034 | 5.75 | 3 | Mb |
| 6/30/2015 | 44:07.4 | 32.9691 | -88.0469 | 5 | 3.8 | Mb |
| 7/1/2015 | 06:46.5 | 35.1023 | -85.4922 | 20.26 | 2.6 | Md |
| 7/21/2015 | 10:45.4 | 36.4482 | -83.7422 | 13.64 | 2.7 | Md |
| 11/7/2015 | 32:20.4 | 35.0547 | -84.8615 | 9.42 | 2.6 | Md |
| 11/16/2015 | 48:38.2 | 33.209 | -83.353 | 9.12 | 2.6 | Md |
| 11/22/2015 | 31:20.3 | 35.2832 | -83.3175 | 3.74 | 2.5 | Md |
| 12/10/2015 | 58:49.5 | 35.578 | -84.9827 | 22.11 | 2.6 | Md |
| 12/11/2015 | 16:46.8 | 36.2613 | -84.2735 | 10.56 | 2.5 | Md |

| | | | | | | |
|---|---|---|---|---|---|---|
| 12/13/2015 | 38:26.3 | 36.6842 | -83.7167 | 9.12 | 2.6 | Md |
| 1/4/2016 | 15:20.7 | 36.5057 | -84.0155 | 21.99 | 2.6 | Md |
| 1/15/2016 | 38:25.9 | 34.126 | -87.521 | 5 | 2.6 | Md |
| 2/18/2016 | 21:11.4 | 34.7472 | -85.3797 | 5.36 | 2.5 | Md |
| 2/18/2016 | 21:11.4 | 34.7472 | -85.3797 | 5.36 | 2.5 | Md |
| 2/20/2016 | 24:32.9 | 36.189 | -83.3103 | 4.81 | 2.5 | Md |
| 2/20/2016 | 24:32.9 | 36.189 | -83.3103 | 4.81 | 2.5 | Md |
| 4/12/2016 | 15:25.5 | 35.161 | -84.4653 | 13.33 | 2.5 | Md |
| 4/19/2016 | 35:46.0 | 35.598 | -84.43 | 9.02 | 2.5 | Md |
| 4/25/2016 | 00:11.7 | 35.3117 | -84.2303 | 17.32 | 2.5 | Md |
| 4/29/2016 | 58:13.4 | 33.3773 | -87.1819 | 1.98 | 3 | Mb |
| 4/30/2016 | 15:03.3 | 35.4725 | -84.0597 | 17.26 | 2.5 | Md |
| 5/8/2016 | 09:56.0 | 36.1145 | -83.7825 | 16.13 | 2.6 | Md |
| 6/7/2016 | 40:45.6 | 34.51 | -85.4845 | 9.21 | 2.5 | Md |
| 6/17/2016 | 38:15.3 | 35.3502 | -84.8732 | 17.96 | 2.6 | Md |
| 8/23/2016 | 58:11.0 | 33.5276 | -87.4096 | 1.6 | 2.5 | Mb |
| 9/5/2016 | 28:27.3 | 32.9802 | -88.0872 | 0.01 | 2.6 | Md |
| 9/7/2016 | 07:27.9 | 35.8962 | -83.681 | 23.79 | 2.5 | Md |
| 9/26/2016 | 05:04.5 | 35.3207 | -84.5148 | 5.56 | 2.5 | Md |
| 10/25/2016 | 42:50.5 | 35.8158 | -84.0938 | 3.32 | 2.7 | Md |
| 10/30/2016 | 01:47.4 | 35.619 | -84.2315 | 9.7 | 2.6 | Md |
| 12/13/2016 | 37:31.2 | 35.7103 | -82.8548 | 6.08 | 2.6 | Md |

Md = Duration; ML = Local; Mw = Moment; Mc = Coda
Source: Northern California Earthquake Data Center 2014.

As described in the 2010 SEIS, the most significant earthquake to occur near the BLN Property since 1973 was the Fort Payne earthquake, which occurred on April 29, 2003, in northeastern Alabama, near the Georgia border. This earthquake had a measured short-period surface wave magnitude of 4.9 and a moment magnitude of 4.6 (USGS 2003). The Fort Payne earthquake caused minor damage, including damage to chimneys, cracked walls and foundations, broken windows, and collapse of a sinkhole 29 feet wide near the epicenter (Geological Survey of Alabama 2009). Based on a reconnaissance in the epicentral area, no landslides were reported and damage to chimneys was observed only for chimneys with masonry in poor/weakened condition. Other masonry, including chimneys in good condition, and several old masonry buildings did not appear to be damaged. The earthquake occurred at a depth of about 5.0 to 9.3 miles (Kim 2009; USGS 2003). Based on the USGS's Community Internet Intensity Map, the observed MMI at the BLN Property would have been IV to V (USGS 2003). The Fort Payne earthquake's magnitude is lower than that of the maximum historical earthquake in the southern Appalachians, which was the 1897 Giles County, Virginia earthquake. The 1897 earthquake had a maximum MMI of VII and an estimated body wave magnitude of 5.8. Therefore, the 2003 Fort Payne earthquake is well within the known historical maximum magnitude earthquake in the southern Appalachian region and is consistent with the earthquake history of the region described in TVA's 1974 FES, 1986 FSAR, and the 2008 COLA FSAR.

As the record of recent earthquakes indicates, small to occasionally moderate earthquakes continue to occur in the southern Appalachians. Data from regional seismic monitoring networks, which have been in operation since the 1980s, indicate that the vast majority of these earthquakes occur within the basement rocks of the southern Appalachian Mountains at depths from 3.1 to 16.1 miles. Reactivation of zones of existing weaknesses within the basement rocks are believed to be responsible for present day earthquake activity in the region (Algermissen and Bollinger 1993).

### 3.17.2 Environmental Consequences

#### 3.17.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is" condition and the site would continue to be secured and monitored. There would be no impacts associated with seismology under the No Action Alternative.

#### 3.17.2.2 Alternative B – Complete the Sale of the BLN Property

Given the historical record of seismic activity in the BLN Property region as described above, TVA believes the impact conclusions from the 2010 SEIS are unchanged. TVA believes the basis for the safe shutdown earthquake described in Section 2.5 of the BLN FSAR (TVA 1986) is still valid. The largest historical earthquake in the Southern Appalachian Tectonic Province remains the 1897 Giles County, Virginia earthquake.

At such time that an agreed regulatory framework is established for completion of the nuclear units at the BLN Property, it is assumed Nuclear Development would perform design-basis analyses to demonstrate compliance with regulatory requirements.

## 3.18 Radiological Effects of Normal Operations

### 3.18.1 Affected Environment

The potential radiological dose exposure to the public during normal operation of nuclear units at the BLN Property has been assessed in previous documents including TVA's 1974 FES and the Atomic Energy Commission's (AEC)[1] 1974 FES. In the FES, the AEC concluded, "No significant environmental impacts are anticipated from normal operational releases of radioactive materials. The estimated dose to the public within 50 miles from operation of the plant is about 2 man-rems [per] year, less than the normal fluctuations in the 144,000 man-rems [per] year background dose this population would receive."

Although TVA's 1974 FES and AEC's review predated the issuance of Appendix I of 10 CFR Part 50 (NRC 2007b), when compared to the Appendix I guidance, the units would fully comply. Appendix I provides numerical guides for design objectives and limiting conditions for operation

[1] The AEC was established by Congress in the Atomic Energy Act of 1946 to both encourage the use of nuclear power and regulate its safety. The Energy Reorganization Act of 1974 abolished the AEC and created the NRC as its replacement.

to meet the criterion “as low as reasonable achievable” for radioactive material in light-water cooled nuclear reactor effluents. TVA’s 2010 SEIS and 2008 COLA ER presented new analyses which were in agreement with the earlier assessments; doses to the public resulting from the discharge of radioactive effluents from either a single Babcock and Wilcox unit or two AP-1000 units would be a small fraction of the NRC guidelines given in 10 CFR Part 50, Appendix I.

Evaluation of the potential impacts to the public from normal operational releases is based upon the probably pathways to individuals, populations, and biota near the BLN Property. The exposure pathways are described in NRC Regulatory Guides 1.109 and 1.111 (NRC 1977a; NRC 1977b) and summarized in TVA’s 2010 SEIS and 2008 COLA ER. The critical pathways to humans for routine radiation releases from a facility at the BLN Property are exposure from radionuclides in the air, inhalation of contaminated air, drinking milk from a cow that feeds on open pasture near the site, eating vegetables from a garden near the site, and eating fish caught in the Tennessee River.

Radiation exposure pathways to biota other than members of the public were assessed to determine if the pathways could result in doses to biota greater than those predicted for humans. This assessment used surrogate species that provide representative information on the various dose pathways potentially affecting broader classes of living organisms. Surrogates are used because important attributes are well defined and are accepted as a method for judging doses to biota. Surrogate biota used algae (surrogate for aquatic plants), invertebrate’s (surrogate for fresh water mollusks and crayfish), fish, muskrat, raccoon, duck, and heron.

The exposure pathways to humans that were used in the 1974 FES, 2008 COLA ER, and 2010 SEIS analyses for liquid effluents remain valid and include the following:

- External exposure to contaminated water by way of swimming, boating, or walking on the shoreline.
- Ingestion of contaminated water.
- Ingestion of aquatic animals exposed to contaminated water.

Exposure pathways considered include external doses due to noble gases, internal doses from particulates due to inhalation, and the ingestion of milk, meat, and vegetables (including grains) within a 50-mile radius around the BLN Property.

### 3.18.2 Environmental Consequences

#### 3.18.2.1 Alternative A – No Action

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the “as-is” condition and the site would continue to be secured and monitored. Therefore, there would be no radiological impacts under the No Action Alternative.

#### 3.18.2.2 Alternative B – Complete the Sale of the BLN Property

Estimated doses to the maximally exposed individuals (as defined by 10 CFR Part 50) and the general population during routine operations for the BLN Property, and for both the liquid and gaseous effluent pathways, are described in Section 3.17.2 of TVA's 2010 SEIS. As Nuclear Development has not completed their plans for the design and operation of the BLN Property, these analyses are still applicable as the best available data at this time. The conclusion in TVA's 2010 SEIS was that:

- Each unit would meet the dose guidelines given in 10 CFR Part 50 Appendix I.
- The dose estimates to the public are a small fraction of the Appendix I guidelines, and the analyses of the radiological impact to humans from liquid releases in the 1974 TVA FES, 2008 COLA ER, and 2010 SEIS continue to be valid.
- The collective population doses are low.
- The impact to members of the public resulting from normal liquid-effluent releases would be minor.
- The individual doses due to normal liquid and gaseous-effluent releases would be insignificant and well below the regulatory guidelines in Appendix I of 10 CFR Part 50 and the regulatory standards of 10 CFR Part 20.
- Potential doses to the public due to the release of liquid and gaseous effluents meet the requirements of 10 CFR § 20.1302 and 10 CFR § 50.34a.
- The calculated biota doses are well below those specified in 40 CFR Part 190 and are well below any does expected to have any noticeable acute effects.

Based on the analyses in the 2010 SEIS and the 2008 COLA ER, normal operation of either one or two nuclear units on the BLN Property would present minimal risk to the health and safety of the public. The annual doses to the public would be well within all regulatory limits, and there would be no observable health impacts on the public from completion and operation of the BLN Property. Since the analysis was completed in the 2010 SEIS, the population in Jackson County has been gradually decreasing as recorded in the 2010 census and 2015 census estimates discussed in Section 3.19. Correspondingly, impacts to the local population would also decrease marginally. Therefore, the direct and indirect impacts to the public from operation of the BLN Property is still anticipated to be minor.

Under NRC regulations, Nuclear Development would be required to conduct a Radiological Environmental Monitoring Program (REMP) to provide the preoperational and operational monitoring of the BLN Property. The REMP would be designed to provide the monitoring necessary to document compliance with 10 CFR § 20.1302, "Compliance with Dose Limits for the Individual Members of the Public," and to meet the requirements established by NRC Regulatory Guide 4.1, "Radiological Environmental Monitoring for Nuclear Power Plants." The REMP is designed to monitor the pathways between the plant and the general public in the vicinity of the plant. Sampling locations, sample types, collection frequency, and sample analysis are chosen so that the potential for detection of radioactivity in the environment will be

maximized. The BLN REMP would be designed based on the guidance provided in NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors." Quality assurance and quality control procedures and processes would be implemented in accordance with NRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment." The REMP would include direct radiation monitoring, airborne pathway monitoring, waterborne pathway monitoring, annual land use surveys, and an interlaboratory comparison program.

## 3.19 Socioeconomics and Environmental Justice

The direct and indirect effects of the socioeconomic environment are described in the following subsections. Environmental consequences are described for the no action alternative and the completion of the sale of the BLN Property.

### 3.19.1 Population

#### 3.19.1.1 Affected Environment

The BLN Property is located in Jackson County, Alabama, in the northeast corner of the state (Figure 1-1). The population of the area was described in previous analyses. However, the population of the county has decreased since those analyses were completed.

The 2010 Census of Population count for Jackson County was 53,227 (U.S. Census Bureau [USCB] 2010a). The U.S. Census Bureau estimate for 2015 shows a small decline in the population of Jackson County to 52,419 (USCB 2015a). The 2010-2014 estimated population living within 10 miles of the BLN Property is approximately 25,900; of these, about 4,600 live within 5 miles (Census 2014). Except for a small area in DeKalb County, southeast of the site, all of the area within 10 miles of the BLN Property is in Jackson County. The City of Scottsboro, Alabama, is the principal economic center closest to the site and had a 2010 Census population of 14,770. The closest incorporated place is Hollywood, a town with a population of 1,000 (USCB 2010b).

In addition to the residential population surrounding the site, there are substantial transient populations within 50 miles of the site due to the following major nearby attractions: Lake Guntersville Park, with several thousand visitors per year; several campgrounds and RV parks; the Unclaimed Baggage Center in Scottsboro, with over a million visitors per year; and the Goose Pond Colony Golf Course, the second-largest attractor of transient population in the area with more than 100,000 visitors per year. Transient populations are discussed in detail in the COLA ER, Subsection 2.5.1.3.

#### 3.19.1.2 Environmental Consequences

*Alternative A*

Under the No-Action Alternative, TVA would not dispose of the BLN Property and would continue to maintain the site. The site and all onsite infrastructure would be left in the "as-is"

condition and the site would continue to be secured and monitored. No direct or indirect impacts to the population of the area would occur as no changes to population drivers would occur.

*Alternative B*

The 2008 COLA ER analyzed the estimated construction and operations workforce that would be present at the BLN Property as a result of construction of two nuclear units. The peak construction workforce analyzed was approximately 3900 workers and the peak operational workforce was approximately 800. While Nuclear Development's workforce would be determined once its development plans for the BLN Property are finalized, it is reasonable to assume the numbers of required workers would be similar due to the similarities in the projects.

According to Subsection 4.4.2.1 of the 2008 COLA ER, construction-phase workers and their families would represent a small percentage of the existing county population, and the impact of in-migration was anticipated to be small. The impacts to the communities within the 6-mile vicinity (Scottsboro, and the area along its major transportation routes) were expected to be moderate. As populations in the vicinity of the BLN Property have increased since the 2008 COLA, the incremental impact of the construction workforce now represents a smaller percentage of the existing county population. Consequently, impacts to the communities within the 6-mile vicinity are expected to be minor.

If Nuclear Development were to complete construction of the nuclear units at the BLN Property in stages, then one unit would be completed and would become operational before the second unit. Additionally, the operational workforce may be onsite prior to completion of either unit for training and other purposes. Therefore, it is likely that some of the estimated approximately 800 operational workforce would overlap with construction at the BLN Property. The impacts would be expected to be minor, similar to those discussed in the 2008 COLA ER, Subsection 5.8.2.1, where the percent of increase in population for Jackson County was predicted to be below 1 percent.

### 3.19.2 Employment and Income

#### 3.19.2.1 Affected Environment

Employment and income in the area were not discussed in TVA's 1974 FES. They were discussed in the 1997 BLN Conversion FEIS, Subsection 3.1.12.2, and in the 1999 CLWR FEIS, Subsection 4.2.3.8. Employment and income in Jackson County have increased since these earlier studies were prepared (U.S. Department of Commerce, Bureau of Economic Analysis [BEA] 2010a). The American Community Survey 2011-2015 census estimates are that the county unemployment rate is 10.7 percent, higher that the Alabama estimate of 9.3 percent and the United States estimate of 8.3 percent (USCB 2015b). In 2015, total employment in Jackson County averaged 24,095, only a slight decrease from 2008 when it averaged 25,841 (BEA 2010b; BEA 2015a). In 2015, per capita personal income averaged $33,900, about 10.7 percent of United States average incomes and 89.2 percent of Alabama average incomes (BEA 2015b) (see Table 3-10).

In Jackson County, the largest employer is the manufacturing sector with 23.4 percent of total jobs (Table 3.19-1), followed by government (14.7 percent) and retail trade (12.3 percent). Farming, manufacturing, retail trade, and government account for a greater share of employment in Jackson County than they do at either the state or national level. The private service sector accounts for a smaller share. While the production of textile products dominates, other industries in Jackson County include paper products, machinery, and furniture and related products (Jackson County Economic Development Authority 2017a). Industries based in the town of Hollywood include structural steel fabrication, sheet metal works, automotive interior carpeting, and specialty signs (Jackson County Economic Development Authority 2017b). Both employment and income are discussed in the 2010 SEIS, Subsection 3.12.2.1, as well as the 2008 COLA ER, Subsection 2.5.2.1.

**Table 3.19-1. Employment and Income in 2015**

| Category | Percent by Region | | |
|---|---|---|---|
| | Jackson County | Alabama | United States |
| Farming | 5.6% | 1.7% | 1.0% |
| Administration and support and waste management and remediation | 5.0% | 6.8% | 6.0% |
| Construction | 5.7% | 5.3% | 4.5% |
| Manufacturing | 23.4% | 10.3% | 8.4% |
| Wholesale Trade | 3.1% | 3.3% | 4.0% |
| Retail Trade | 12.3% | 11.0% | 10.8% |
| Accommodation and food service | 5.6% | 7.2% | 8.9% |
| Government | 14.7% | 15.4% | 16.7% |
| Other | 6.3% | 6.6% | 4.8% |
| Total Employment | 100% | 100% | 100% |
| Per Capita Personal Income | $33,900 | $38,030 | $48,122 |

Source: BEA 2015a, BEA 2015c, BEA 2015d

The manufacturing sector accounts for about 15.1 percent of total earnings in the county, considerably more than in the state as a whole (9.5 percent) and the nation (6.8 percent). Farm earnings accounted for almost 2 percent of total earnings in the county, compared to less than 1 percent in the state and less than 1 percent in the nation. (BEA 2015e)

### 3.19.2.2 Environmental Consequences

*Alternative A*

Under Alternative A, the No Action Alternative, TVA would not sell the BLN Property and no direct or indirect impacts to employment would occur.

*Alternative B*

Under Alternative B, TVA would sell the BLN Property which would then presumably be developed into a functional nuclear plant. Hence, the indirect impacts of the sale would be

roughly equivalent to the direct impacts of completion and operation of the nuclear units at the BLN Property. These impacts were analyzed in the 2008 COLA ER for a two unit operation.

The 2008 COLA ER concluded that the increase in employment for completion or construction of two nuclear units at the BLN Property could result in creation of some new temporary secondary jobs, especially during and near peak employment. Many of these jobs would be temporary in nature, and the number of such jobs would vary depending on the level of employment. These impacts would be beneficial. As the number of workers analyzed in the 2008 COLA ER are assumed to be similar to the number of workers that would be required for completion and operation of the BLN Property by Nuclear Development, the 2008 COLA ER analysis is assumed to be a reasonable estimate of the impacts. As described in Section 3.19.1.1 of this EA, because the number of workers estimated to be needed for completion and operation of the BLN Property is small enough in proportion to the current population of the county it is assumed that the beneficial impact to employment would be minor.

The 2008 COLA ER also found that expenditures within the region for goods and services during construction of the BLN Property would have a small beneficial impact on income in the region. Based on the current economic conditions of the area, population, and similar estimates for workforce, it is assumed the proposed actions would also result in a small beneficial impact on regional income. This increase could be noticeable in the local area, especially for establishments providing frequently purchased items such as food, and would be considered moderate and beneficial.

Operation of the plant would result in creation of permanent jobs from the hiring of employees to supervise, operate, and maintain the plant. The impacts would generally be beneficial, resulting in a small increase in the average income in the county, small increases in sales at retail and service establishments, and a temporary increase in home sales or rentals. These impacts could lead to some additional hiring, particularly at retail and service establishments, causing a small decrease in unemployment. Overall impacts on employment and income are expected to be small and beneficial in the region and moderate and beneficial in the county.

### 3.19.3 Housing

#### 3.19.3.1 Affected Environment

Based on prior TVA evaluations, no more than half of the anticipated construction workers for completion of the nuclear units at the BLN Property are expected to need housing in the area (TVA 1985a; 2008a; 2010). For most movers, Jackson County is expected to be the preferred location, if accommodations are available, for both construction and operations workers. As of the 2010 Census, Jackson County had 3,273 vacant housing units, with 929 housing units available, either for sale or for rent (USCB 2010a).

Temporary housing is also available at local hotels/motels in the Scottsboro area and at local campgrounds and recreational vehicle (RV) parks. The Census Bureau 2011-2015 estimates indicate 4,327 housing units are vacant in Jackson County. The homeowner vacancy rate is 2.4 percent while the rental vacancy rate is 16.0 percent (USCB 2015a). As described in Subsection

4.4.2.4 of the 2008 COLA ER, as of July 2008, there were approximately 330 hotel guest rooms. However, the 2010 SEIS reported that the addition of two recently opened hotels in Scottsboro brings the total number of guest rooms to approximately 470. There are also 320 campsites in Jackson County. Housing is discussed in greater detail in the COLA ER, Subsection 2.5.2.6.

#### 3.19.3.2 Environmental Consequences

*Alternative A*

Under Alternative A, the No Action Alternative, TVA would not sell the BLN Property and no direct or indirect impacts to housing would occur.

*Alternative B*

During construction, the majority of the employees for the BLN Property would be expected to live in Jackson County. Workers who do not find acceptable facilities in Jackson County would likely locate to the west in Madison County, south or east in Marshall or DeKalb counties, or to the north in Tennessee. Impacts of in-migration are discussed in the previous documents. Residential housing in the vicinity of the BLN Property has increased somewhat since the 2008 COLA ER and the 2010 SEIS. However, the available housing in Jackson County is still lower than the estimated construction workforce. It is anticipated that prior to project implementation, Nuclear Development may conduct a review the availability of housing prior to the construction phase to assess the need for mitigation, which could include housing assistance for employees, transportation assistance for commuting employees, or remote parking areas with shuttles. Therefore, the impact on housing would be minor in the 50-mile region and in the county.

### 3.19.4 Environmental Justice

#### 3.19.4.1 Affected Environment

EO 12898 directs federal agencies to identify and address, as appropriate, potential disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. While TVA is not subject to this EO, TVA typically assesses environmental justice impacts in its NEPA reviews. This section provides demographic information that characterizes the distribution of minority populations and low-income populations in the project area.

In identifying minority and low-income populations, the following Council on Environmental Quality definitions of minority individuals and populations and low-income populations were used:

- *Minority individuals.* Individuals who identify themselves as members of the following population groups: American Indian or Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, Black, Hispanic, or two or more races.

- *Minority populations.* Minority populations are identified where: (1) the minority population of an affected area exceeds 50 percent, or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

- *Low-income populations.* Low-income populations in an affected area are identified with the annual statistical poverty thresholds from the Census Bureau's Current Population Reports, Series P-60, on Income and Poverty (Council on Environmental Quality, 1997).

According to Council on Environmental Quality guidance, U.S. Census data are typically used to determine minority and low-income population percentages in the affected area of a project.

An in-depth analysis of the low-income and minority populations was conducted in 2008 in response to NRC sufficiency review comments on the 2008 COLA ER and was summarized in the 2010 SEIS. As part of that analysis, TVA produced the "Bellefonte Nuclear Plant Environmental Justice Impact Assessment Methodology and Findings," report in April 2008 (TVA 2008b). That paper discussed the methodology used to identify low-income and minority populations located on or near the BLN Property, identified the agencies and other parties contacted to assist in identifying these populations, and provided an explanation of the environmental justice impacts assessments. TVA is not aware of any significant changes in subsistence or transient populations since that report. The following section discusses changes in low-income and minority populations.

The minority population in the town of Hollywood, the City of Scottsboro, Jackson County, the State of Alabama, and the United States is shown in Table 3.19-2 based on 2010 Census data. The minority population within a 2-, 5-, and 10-mile radius of the BLN Property, based on 2010 Census data and 2010-2014 American Community Survey estimates, is shown in Table 3.19-3.

The low–income population is determined from the 2010–2014 American Community Survey estimates. The estimates for the percent of individuals living below poverty are shown in Table 3.19-4.

Based on the demographic and environmental justice analyses set forth above, TVA is not aware of any subsistence resource dependencies, practices, or other circumstances that could result in disproportionate impacts to minority or low-income populations. Specifically, TVA identified no low-income populations within 2 miles of the BLN Property center point where potential plant-related impacts would be expected to be most significant.

To the extent that fishing, hunting, or gardening occur in the BLN Property vicinity or region, it is difficult to differentiate between those activities that are recreational in nature and those that are subsistence practices. No data have been identified that associates subsistence practices with any TVA-identified minority or low-income groups.

### 3.19.4.2 Environmental Consequences

*Alternative A*

Under Alternative A, the No Action Alternative, TVA would not sell the BLN Property and no direct or indirect impacts to minority or low-income populations would occur.

*Alternative B*

Given the distribution of minority and low-income populations in the vicinity of the BLN Property, the potential for disproportionate socioeconomic impacts would be small. Transportation and housing are identified as the socioeconomic impact categories with the greatest potential to affect minorities and low-income populations disproportionately during construction, these impacts are discussed below.

Although there are minority populations in the vicinity of the BLN Property, these populations are not concentrated along site access roads and thus would not be adversely impacted by construction traffic. Because available housing in the vicinity is limited, there is a potential for increased demand from the influx of plant construction workers to result in rental rate and housing cost increases. Any such increases would affect the low-income population in the vicinity disproportionately to higher income groups, which could better absorb the increased costs. However, with mitigation measures, such as those described in the 2008 COLA ER, Subsection 4.4.2.4, and Subsection 3.13.4.2 of the 2010 SEIS, this impact could be reduced. It is assumed that Nuclear Development may be required by NRC to review the availability of housing and assess the need for mitigation as part of their permitting process.

Beneficial socioeconomic impacts from completion of a nuclear unit at the BLN Property were described in the 2008 COLA ER, Subsection 4.4.2. They are principally applicable to the counties in the region and include increased employment opportunities, potentially greater income, both directly and indirectly related to plant construction. These beneficial impacts also would be realized by minority and low-income populations and would not be disproportionate to minority and low-income populations in the vicinity and region. The 2008 COLA ER evaluated operational and socioeconomic impacts on low-income and minority populations in Subsection 5.8.3 and concluded that, overall, impacts would be minor, and given the distribution of minority and low-income populations, the potential for disproportionate impacts to those populations would be small. This analysis is still applicable.

TVA did not identify any location-dependent, disproportionate high or adverse impacts to minority and low-income populations. Overall, socioeconomic impacts would be minor, and given the distribution of minority and low-income populations, the potential for disproportionate impacts to those populations would be small. Based on the analysis in the 2008 COLA ER, Subsection 2.5.4 and the current analysis, no significant natural resource dependencies in any population were identified in the 50-mile region. Beneficial impacts from the operation of a nuclear unit at the BLN Property to the surrounding vicinity and region include the addition of new jobs, and taxes paid by site workers, which in turn benefit local public services and the local education systems. These beneficial impacts also would be realized by minority and low-income populations, and would not be disproportionate to minority and low-income populations in the vicinity and region.

**Table 3.19-2. 2010 Census Minority Population in Hollywood, Scottsboro, Jackson County, the State of Alabama, and the United States**

| | Hollywood | Percent (%) | Scottsboro | Percent (%) | Jackson County | Percent (%) | Alabama | Percent (%) | United States | Percent (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Population** | **1,000** | **100.0** | **14,770** | **100.0** | **53,227** | **100.0** | **4,779,736** | **100.0** | **308,745,538** | **100.0** |
| Hispanic or Latino | 49 | 4.9 | 522 | 3.5 | 1,339 | 2.5 | 185,602 | 3.9 | 50,477,594 | 16.3 |
| Non Hispanic or Latino | 951 | 95.1 | 13,093 | 88.6 | 51,888 | 97.5 | 4,594,134 | 96.1 | 258,267,944 | 83.7 |
| White | 758 | 75.8 | 13,258 | 89.8 | 47,937 | 90.1 | 3,204,402 | 67.0 | 196,817,552 | 63.7 |
| African American | 148 | 14.8 | 672 | 4.5 | 1,771 | 3.3 | 1,244,437 | 26.0 | 37,685,848 | 12.2 |
| American Indian and Alaska Native | 9 | 0.9 | 98 | 0.7 | 680 | 1.3 | 25,907 | 0.5 | 2,247,098 | 0.7 |
| Asian | 3 | 0.3 | 106 | 0.7 | 165 | 0.3 | 52,937 | 1.1 | 14,465,124 | 4.7 |
| Native Hawaiian and Pacific Islander | 0 | 0.0 | 27 | 0.2 | 29 | 0.1 | 1,976 | 0.0 | 481,576 | 0.2 |
| Other | 0 | 0.0 | 6 | 0.0 | 24 | 0.0 | 4,030 | 0.1 | 604,265 | 0.2 |
| Two or More Races | 33 | 3.3 | 246 | 1.7 | 1,282 | 2.4 | 60,445 | 1.3 | 5,966,481 | 1.9 |

Source: U.S. Census Bureau 2010a

**Table 3.19-3. 2010 Census and 2010-2014 Estimates for the BLN Property Vicinity Minority Population**

| | 2 Mile Radius 2010 Census | Percent (%) | 2 Mile Radius 2010-2014 Estimate | Percent (%) | 5 Mile Radius 2010 Census | Percent (%) | 5 Mile Radius 2010-2014 Estimate | Percent (%) | 10 Mile Radius 2010 Census | Percent (%) | 10 Mile Radius 2010-2014 Estimate | Percent (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Population** | **235** | | **277** | | **4,690** | | **4673** | | **25,893** | | **26178** | |
| Total Minority Population | 33 | 14.0 | 24 | 9.0 | 562 | 12.0 | 507 | 11.0 | 2,794 | 11 | 3156 | 12.0 |
| Hispanic or Latino | 6 | 3.0 | 4 | 2.0 | 144 | 3.0 | 104 | 2.0 | 696 | 3 | 923 | 4.0 |
| Non Hispanic or Latino | 229 | 97.0 | 273 | 98.0 | 4,546 | 97.0 | 4569 | 98.0 | 25,197 | 97 | 25255 | 96.0 |
| White | 202 | 86.0 | 254 | 91.0 | 4,128 | 88.0 | 4166 | 89.0 | 23,099 | 89 | 23022 | 88.0 |
| African American | 17 | 7.0 | 15 | 6.0 | 234 | 5.0 | 230 | 5.0 | 1,061 | 4 | 1033 | 4.0 |
| American Indian and Alaska Native | 3 | 1.0 | 1 | 0.0 | 57 | 1.0 | 78 | 2.0 | 299 | 1 | 624 | 2.0 |
| Asian | 1 | 0.0 | 2 | 1.0 | 12 | 0.0 | 27 | 1.0 | 106 | 0 | 135 | 1.0 |
| Native Hawaiian and Pacific Islander | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 27 | 0 | 12 | 0.0 |
| Other | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 10 | 1 | 17 | 0.0 |
| Two or More Races | 6 | 3.0 | 1 | 0.0 | 114 | 2.0 | 68 | 1.0 | 595 | 2 | 413 | 2.0 |

Source: U.S. Census Bureau 2010a, 2014

**Table 3.19-4. Percent of Individuals Living Below Poverty**

| 2010-2014 ACS Estimate | Percent of Individuals Below the Poverty Level (%) |
|---|---|
| 2 Mile Radius | 12.0 |
| 5 Mile Radius | 15.0 |
| 10 Mile Radius | 19.0 |
| Hollywood | 19.0 |
| Scottsboro | 16.7 |
| Jackson County | 18.2 |
| State of Alabama | 18.9 |
| United States | 15.6 |

Source: U.S. Census Bureau 2014

## 3.20 Cumulative Impacts

Cumulative impacts are defined in the Regulations for Implementing the Procedural Provisions of the NEPA (Council on Environmental Quality, 1987) as follows:

> Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Past actions that have already occurred and present actions are integrated into the existing baseline conditions discussed above. Table 3.20-1 summarizes and the following section analyses the reasonably foreseeable future actions in the immediate vicinity of the BLN Property and within Jackson County. Projects planned elsewhere in the community are not likely to have a cumulative impact with respect to completion and operation of the BLN Property as these other projects would be a considerable distance from the BLN Property project area.

Four current and/or future projects (the proposed transfer of Bellefonte Road and the boat ramp, the proposed solar facility, Jackson County Industrial Park, and the U.S. Highway 33 expansion) are in the immediate vicinity of the BLN Property. The Goose Pond Colony resort hotel is located south of the BLN Property in Scottsboro, Alabama. The Widows Creek Fossil Plant (WCF) and Google Data Center projects are located in Bridgeport, Alabama northeast of the BLN Property. These projects could be initiated or in progress during the period in which the completion and operation of the nuclear units would occur.

Completion of construction and commencement of operations at the BLN Property could contribute to minor cumulative impacts in association with these projects. This section discusses those resources and receptors that could experience potential cumulative impacts. No substantive cumulative impacts are expected for land use, surface water, groundwater,

floodplains, wetlands, aquatic ecology, wildlife, vegetation, threatened and endangered species, climate change, noise, hazardous materials and solid and hazardous waste, natural areas, cultural and historic resources, and seismology. The potential for cumulative impacts to air quality, transportation, and socioeconomics and environmental justice are discussed in the following sections.

**Table 3.20-1. Summary of Present or Reasonably Foreseeable Future Actions in the Vicinity of the Proposed Project and within Jackson County**

| Actions Description | Description | Timing |
|---|---|---|
| Proposed transfer of Bellefonte Road and boat ramp | TVA is considering transferring the remainder of Bellefonte Road (not included in the sale of the BLN Property) and the adjacent boat ramp to Jackson County. | Possible Future |
| Jackson County Industrial Park | Approximately 280 acres of land adjacent to U.S. Highway 72 and the old BLN Property rail spur is available for development for general industrial use. | Future |
| U.S. Highway 33 Construction | Addition of lanes to U.S. Highway 33 south of the BLN Property and across the Tennessee River (Guntersville Reservoir). | Present/Future |
| Goose Pond Colony Resort | The City of Scottsboro is planning construction of an approximately 100 bed resort style hotel at Goose Pond on the banks of the Tennessee River (Guntersville Reservoir). | Future |
| Widows Creek Fossil Plant (WCF) Switchyard Improvements | Installation of new equipment including towers, lines, transformers, and switch houses. | Future |
| WCF Gypsum Stack Closure | Closure of gypsum stack and cover within the WCF property using soils excavated from adjacent property. | Present/Future |
| WCF Ash Impoundment Closure | TVA would close the 350 acre Ash Impoundment Complex on the WCF property. Activities include constructing a cover over the impoundment using soils excavated from an onsite borrow area. | Future |
| Google Data Center Development | Construction of a new data center on approximately 350 acres adjacent to the WCF property in Bridgeport, Alabama. Adjacent to and northwest of the WCF deconstruction site in Bridgeport, Alabama. The data center would operate as a hub for Internet traffic 24 hours a day, seven days a week and is anticipated to create up to 100 jobs. | Present/Future |
| Proposed Solar Facility | NextEra has proposed a potential solar facility west of the BLN Property. This proposal is still being studied. | Possible Future |

### 3.20.1 Land Use

It is assumed the majority of any new construction on the BLN Property would occur within previously disturbed and developed areas. No known offsite construction would be required with respect to Nuclear Development's proposed use of the BLN Property. The proposed solar facility adjacent to the BLN Property would result in a change in land use on that land. However, cumulative impacts to land use would not be anticipated as significant changes to land use at the BLN Property would not be expected.

### 3.20.2 Surface Water

TVA assumes Nuclear Development would comply with all federal, state, and local regulations and obtain all required permits to minimize impacts to water quality. Therefore, no significant long-term or cumulative water quality impacts are expected as a result of completion and operation of the nuclear units at the BLN Property. It is assumed all discharges from the BLN Property would be regulated by an Alabama state NPDES permit and would comply with applicable water quality standards and criteria. TVA also assumes water treatment processes would be controlled to comply with state water quality criteria and applicable NPDES permit conditions to ensure protection of the receiving water body. The standards and criteria applied by the state in establishing NPDES permit limits and requirements are designed to protect public health and water resources, as well as to maintain the designated uses for the receiving water body. Therefore, cumulative effects of chemical discharges would also be minor.

### 3.20.3 Groundwater

Because the direct and indirect impacts of the proposed action are expected to be minor and TVA is not aware of other activities planned or underway in the vicinity of the BLN Property that would contribute to groundwater impacts, completion and operation of the nuclear units would not be anticipated to result in significant cumulative impacts to groundwater.

### 3.20.4 Floodplains and Flood Risk

The majority of the property involved in the sale of the BLN Property is located outside of the floodplains and above the TVA Flood Risk Profile with the exception of the area around the intake channel and discharge location. Completion and operation of the nuclear units would not increase the flood risk in the Guntersville Reservoir watershed because this activity would not impact upstream flood elevations. Disposal of the BLN Property and completion and operation of nuclear power facilities would, therefore, have no significant cumulative impact on floodplains.

### 3.20.5 Wetlands

Though Nuclear Development's plans for the BLN Property have not been finalized, it is anticipated that the majority of any ground-disturbing activities would occur within already disturbed or developed areas. It is, therefore, also assumed that the majority of wetlands within the BLN Property would not be disturbed by completion and operation of the nuclear units at the BLN Property. It would be the responsibility of Nuclear Development to adhere to USACE regulations and permit requirements for actions that may impact wetlands. Nuclear Development would presumably cooperate in future NEPA analyses to further analyze impacts to wetlands in conjunction with the NRC review and permitting process. Therefore, significant cumulative impacts to wetlands would not be anticipated as a result of completion and operation of the BLN Property. Should Nuclear Development and other projects impact wetlands in the vicinity, minor impacts could occur.

### 3.20.6 Aquatic Ecology

No new in-water construction is currently anticipated, and if future work were required TVA assumes it would occur in compliance with USACE permits and requirements. Impacts

associated with any dredging activities would be minor and temporary and therefore would not contribute to cumulative effects. It is assumed operation of the nuclear units would be in compliance with discharge limits and permit requirements and thermal effects on the aquatic communities in the vicinity are anticipated to be minimal due to the relatively small amount of heat involved. Impacts on aquatic life from chemical or radiological releases would be minor. With permit and regulatory compliance during operations, these effects would be minor, and would not result in cumulative adverse effects on aquatic ecology in the Guntersville Reservoir.

### 3.20.7 Wildlife

As Nuclear Development's final plans are not known at this time, it is assumed for the purposes of this analysis that little of the undeveloped areas would be disturbed for the purposes of completion and operation of the nuclear units. TVA also assumes Nuclear Development would adhere to all state and federal laws (including the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act) for actions that may impact wildlife or their habitats. Nuclear Development would also presumably cooperate in future NEPA analyses to further analyze impacts to wildlife in conjunction with the NRC review and permitting process. Therefore, no cumulative effects to wildlife would be anticipated.

### 3.20.8 Vegetation

It is anticipated that completion and operations activities would occur within areas already developed and without extensive communities of plants. Disturbances to vegetation on the BLN Property would, therefore, be expected to be limited in scope. TVA assumes criteria gaseous or particulate air pollutants emitted from the facility during construction or operation would be intermittent and limited in amount and thus limited in effects on vegetation. Therefore, it is unlikely that completion and operation of the nuclear units at the BLN Property would result in cumulative impacts to the terrestrial plant ecology of the area.

### 3.20.9 Threatened and Endangered Species

No threatened and endangered species have been identified on the BLN Property; however, there is potential habitat to support certain federally listed species. Species could migrate to the BLN Property in the future. If listed species are present on and affected by actions of other projects in the vicinity, it could result in certain species relocating to suitable habitat on the BLN Property. Relocation of listed species as a result of adjacent project activities could contribute to cumulative impacts at the BLN Property, if those areas were impacted by site activities. As Nuclear Development has not finalized plans for the site, actual potential for impacts to listed species under the Endangered Species Act and necessary mitigation is unknown. TVA assumes Nuclear Development would comply with applicable laws and complete consultation with the USFWS regarding effects to threatened and endangered species. With such compliance and consultation, any required mitigation, as well as the use of typical best management practices, the completion and operation of the nuclear units at the BLN Property would not be expected to contribute significantly to cumulative effects to listed species.

### 3.20.10 Air Quality

Construction projects generate fugitive dust and emissions from construction equipment. Each of these projects in the area and on the BLN Property involve varying degrees of ground disturbance. Some of the projects also include the transport and use of borrow material which contributes to fugitive dust. The combined projects could cause cumulative minor, temporary impacts to air quality in the area, particularly if the construction at the proposed solar facility and at Jackson County Industrial Park were to occur simultaneously with the construction at the BLN Property. Construction typically involves the use of best management practices to control fugitive dust (such as water suppression) and to maintain equipment to control emissions. If Nuclear Development uses these best management practices, potential impacts to air quality would be mitigated, would be temporary, and would be anticipated to be minor.

### 3.20.11 Climate Change

Because GHG emissions associated with the proposed action would not be significant, the completion and operations of the nuclear units at the BLN Property would not be expected to contribute to cumulative impacts associated with climate change.

### 3.20.12 Noise

Because noise is not additive and because of the separation distance between the BLN Property and other known projects in the area (including the adjacent proposed solar facility), cumulative impacts are not anticipated.

### 3.20.13 Hazardous Materials and Solid and Hazardous Waste

Because the disposal of the solid and hazardous wastes from completing construction and operation at the BLN Property would presumably be done in accordance with applicable regulations and at permitted facilities with adequate capacity to serve BLN needs, any adverse effects from the generation, management, and disposal of these wastes are likely to be small. Cumulative effects would be minimized by the use of permitted landfills. These facilities would provide substantiate barriers separating the waste from the at-risk groundwater, and would be capped as well, minimizing the cumulative effect of placing waste from the BLN Property and waste from other sources in the same facility.

### 3.20.14 Transportation

Each of these projects could involve construction traffic traveling along US-72, County Road 33, and Bellefonte Road. If these projects were all under construction simultaneously, this could result in cumulative increases in congestion along US-72 and likely along adjacent roads as well. Such impacts would be anticipated to be temporary, lasting only for the duration of the construction projects and minor due to the presumed use of mitigation measures and traffic controls.

### 3.20.15 Natural Areas, Parks, and Recreation

Several of the projects in the BLN Property vicinity represent growth of local communities. Many of these projects would result in increases in jobs in the vicinity and some of these jobs would

be filled by in-migrating workers and their families. Consequently, an influx in population accompanied by growth in the community could place additional pressures on public usage of natural areas, parks, and recreation facilities. This could result in increased congestion, especially on certain special occasions or holidays. It is assumed that as the local population grows, additional recreation opportunities would also develop, potentially including the development of additional natural areas, parks, and recreational facilities. While the BLN Property actions would potentially contribute to cumulative effects to natural areas, parks, and recreation, these effects would be minor given the estimated in-migrating population for these projects as compared to the current population in the area. Transfer of the boat ramp and Bellefonte Road from TVA to Jackson County would not result in cumulative impacts as the road and ramp would continue to be available for public access.

### 3.20.16 Cultural and Historic Resources

As there would be no anticipated effects to cultural and historic resources as a result of completion and operation of the BLN Property, there would also be no anticipated cumulative effects to cultural and historic resources. Transfer of the road and boat ramp to Jackson County would necessitate a cultural and historic resources review to determine any potential impacts associated with this action.

### 3.20.17 Seismology

At such time that an agreed regulatory framework is established for completion of the nuclear units at the BLN Property, TVA assumes Nuclear Development would perform design-basis analyses to demonstrate compliance with regulatory requirements. Other projects in the vicinity would not be expected to have seismological concerns. Therefore, no cumulative impacts with respect to seismology would be expected.

### 3.20.18 Radiological Effects of Normal Operations

As none of the other projects in the BLN Property vicinity are nuclear in nature, Nuclear Development's completion and operation of the site would not result in cumulative impacts associated with radiological concerns.

### 3.20.19 Socioeconomics and Environmental Justice

The various projects in the area would all contribute to increases in construction and operational jobs available in Jackson County as well as bring additional revenue into the county. The increased job opportunities and the economic boost to the economy would constitute minor beneficial impacts to socioeconomics and potentially for environmental justice communities in the county as well. No cumulative adverse impacts to environmental justice communities would be anticipated.

## 3.21 Unavoidable Adverse Environmental Impacts

TVA's action is to decide whether to complete the sale of the BLN Property to Nuclear Development. While that action does not directly result in unavoidable adverse environmental impacts, the future actions Nuclear Development could take on the site could result in such impacts. Therefore, this section describes principal unavoidable adverse environmental impacts

associated with the presumed use of the BLN Property for completion and operation of the nuclear units, for which mitigation measures are considered either impracticable, do not exist, or cannot entirely eliminate the impact. Specifically, this section considers unavoidable adverse impacts that would occur for the proposed action, Alternative B, completing the sale of the BLN Property to Nuclear Development. The unavoidable construction and operational effects are identified in Table 3.21-1.

**Table 3.21-1. Construction and Operation-Related Unavoidable Adverse Environmental Impacts at the BLN Property**

| Issue | Unavoidable Adverse Impact |
|---|---|
| Land Use | Minor impacts. Completion and operation of the nuclear units could require some re-clearing and grading of certain areas on the BLN Property. There would be a long-term commitment of land for the existing transmission corridors and the developed areas of the site. |
| Surface Water | Minor impacts. A small amount of water would be consumed during construction activities. If ground-disturbing activities occur near river or stream banks, on a short-term basis minor amounts of sediment and potentially chemicals could be introduced into water bodies.<br><br>Normal nuclear unit operations at the BLN Property would result in discharge of small amounts of chemicals and radioactive effluents to the water bodies. Compliance with the NPDES permit, applicable water quality standards, SWPPP, and SPCC plans, and discharge of radioactive effluents in compliance with applicable regulatory standards would ensure that the result would be little or no unavoidable adverse impacts.<br><br>Discharge of cooling water results in a thermal plume in Guntersville Reservoir throughout the operational life of Nuclear Development's project. The differences between plume temperature and ambient water temperature are maintained within limits set in the NPDES permit. Cooling towers mitigate much of the heat that would otherwise be discharged to the reservoir. Use of closed-cycle cooling would result in only minor adverse impacts. |
| Aquatic Ecology | Minor impacts. The effects of entrainment or impingement result in a loss of fish and other aquatic species. Because a closed-loop cooling system that substantively reduces the loss of fish and aquatic species is used, the impacts of entrainment or impingement on aquatic species would be minor.<br><br>Routine maintenance activities may result in rare episodic chemical or petroleum spills near water that could, in turn, affect aquatic life. Preparation and adherence to the SPCC plan would avoid/minimize contamination from any such spills.<br><br>Although within NPDES permit limits, discharge of small amounts of chemicals to Guntersville Reservoir from nuclear unit operations could result in insignificant effects on aquatic life over the operational life of this project. |

| | |
|---|---|
| Socioeconomics and Environmental Justice | Minor impacts. Construction workers and local residents would be exposed to elevated levels of traffic through the course of construction. The influx of construction workers would cause short-term, minor effects on local housing, infrastructure, land use, and community services. Increased tax revenues would mitigate these impacts.<br><br>Operation and outages of the nuclear units at the BLN Property would increase traffic on local roads, especially during shift change.<br><br>Unavoidable adverse impacts to minority populations are not expected to occur. |
| Radiological | Minor impacts. Small radiological doses to workers and members of the public from releases to air and surface water would occur over the operational life of this project. Releases would be well below regulatory limits. Effluents are treated according to applicable regulatory standards before being discharged into Guntersville Reservoir. While employees are potentially exposed over the long term, adherence to applicable regulatory standards, radiological safety procedures, work plans, and safety measures reduce this exposure to a negligible impact. |
| Air Quality and Climate Change | Minor and temporary impacts. Minor radioactive emissions would occur from Nuclear Development's nuclear units would occur during normal operations. Compliance with permit limits and regulations for installing and operating air emission sources and monitoring those air emissions would result in little or no adverse impacts. |

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

One of NEPA's basic EIS requirements is to describe "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity." TVA's action is to decide whether to complete the sale of the BLN Property to Nuclear Development. TVA's intended use of this property since initial purchase has been for power production, specifically nuclear generation. Therefore, with respect to this action, short-term is defined as the 20-year period (2015-2035) evaluated in TVA's 2015 IRP (which considers power generation needs), whereas long-term is defined as the period beyond the year 2035. TVA's Integrated Resource Plan shows that large-scale power generation sources will not be needed for at least 20 years. Given that TVA has no plans for power generation at the BLN Property, there would be no short- or long-term beneficial uses of the site and the site would be unproductive.

In addition to consideration of TVA's short-term uses and long-term productivity, because Nuclear Development proposed to complete and operate the nuclear units at the BLN Property, this section also considers "short-term" uses as the period from start of construction to the end of the Nuclear Development project life and "long-term" productivity as the period extending

beyond the end of plant life. The following discussion applies to the general ramifications of implementing Alternative B.

The short-term beneficial impacts of usage outweigh the adverse impacts on long-term environmental productivity. The principal short-term benefit from completion and operation of the BLN Property would be the production of a relatively clean and stable form of electrical energy. With respect to long-term benefits, nuclear energy avoids carbon dioxide emissions that may have a significant long-term detrimental effect on global climate. Nuclear energy also reduces the depletion of fossil fuels.

There are a number of short-term benefits that are derived from Nuclear Development's plans to complete and operate the nuclear units at the BLN Property. The relationship between short-term uses and benefits and long-term environmental productivity is described below:

- Short-term benefit from electricity generation; completion and operation of the nuclear units at the BLN Property results in the long-term use of materials and energy. However, the reactors would provide far more energy than is consumed in construction.

- Short-term benefit from fuel diversity; reduces the cumulative long-term depletion of global fossil fuel supplies.

- Short-term avoidance of air pollution and long-term avoidance of GHG emissions

- The BLN Property was originally designated for construction of nuclear reactors; therefore, completion and operation of the nuclear units at the BLN Property represents a continuation of the originally planned land use of the site. Continued commitment of land use at the BLN Property, no long-term loss as the land could be available for other uses after decommissioning

- Aquatic and terrestrial biota, no significant short-term or long-term effects to aquatic and terrestrial species

- The radioactively contaminated reactor vessel and equipment are required for the short-term production of nuclear energy. Once the plant ceases to operate and is decommissioned, radiological releases would cease. No future issues associated with the radiological emissions from operation would be expected to affect the long-term uses of the BLN Property.

- Short-term injection of tax revenues, plant expenditures, and employee spending contributions to the local economy can contribute to long-term direct and secondary growth

## 3.23 Irreversible and Irretrievable Commitments of Resources

This section describes anticipated irreversible and irretrievable commitments of environmental resources associated with both TVA's decision to sell the BLN Property and Nuclear

Development's proposed future use of the BLN Property. For the purposes of this analysis, the term "irreversible" applies to the commitment of environmental resources (e.g. permanent use of land) that cannot by practical means be reverse to restore the environmental resources to their former state. In contrast, the term "irretrievable" applies to the commitment of material resources that, once used, cannot by practical means be recycled or restored for other uses.

TVA's decision to sell the BLN Property would result in the irreversible and irretrievable transfer of the BLN Property out of public ownership. TVA's investment in the development of the existing onsite facilities would be irreversibly and irretrievably lost. Because TVA would no longer need to maintain the site, this would result in a long-term cost-savings benefit to TVA and its customers. An additional benefit would result from the completion and operation of the nuclear units by Nuclear Development; the BLN Property would become an economic asset to the region and provide an additional source of clean energy in the region.

# CHAPTER 4 - LIST OF PREPARERS

## 4.1 NEPA Project Management

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| | |
|---|---|
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| | |
|---|---|
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| | |
|---|---|
| Position: | Aquatic Community Ecologist |
| Education: | MS and BS, Wildlife and Fisheries Science |
| Experience: | 6 years sampling and hydrologic determination for streams and wet-weather conveyances; 5 years in environmental reviews |
| Involvement: | Threatened and Endangered Species, Aquatic Ecology |

**Kim Pilarski-Hall (TVA)**

| | |
|---|---|
| Position: | Senior Wetlands Biologist |
| Education: | MS, Geography, Minor Ecology |
| Experience: | 21 years in wetland assessment, wetland monitoring, watershed assessment, wetland mitigation, restoration as well as NEPA and Clean Water Act compliance |
| Involvement: | Natural Areas, Parks and Recreation, Wetlands |

**Carrie C. Williamson, PE, CFM (TVA)**

| | |
|---|---|
| Position: | Program Manager, Flood Risk |
| Education: | BS and MS, Civil Engineering |
| Experience: | 4 years in floodplains, 3 years in river forecasting, 7 years in compliance monitoring |
| Involvement: | Floodplains |

# CHAPTER 5 - ENVIRONMENTAL ASSESSMENT RECIPIENTS

## 5.1 Federal Agencies

USACE, Nashville District
U.S. Fish and Wildlife Service, Daphne Field Office

## 5.2 Federally Recognized Tribes

Eastern Band of Cherokee Indians
United Keetowah Band of Cherokee Indians in Oklahoma
Cherokee Nation
Chickasaw Nation
Muscogee (Creek) Nation of Oklahoma
Thlopthlocco Tribal Town
Kialegee Tribal Town
Alabama-Quassarte Tribal Town
Alabama-Coushatta Tribe of Texas
Eastern Shawnee Tribe of Oklahoma
Shawnee Tribe
Absentee Shawnee Tribe of Oklahoma
Seminole Tribe of Florida
Seminole Nation of Oklahoma
Poarch Band of Creek Indians

## 5.3 State Agencies

Alabama Department of Agriculture and Industries
Alabama Department of Conservation and Natural Resources
Alabama Department of Environmental Management
Alabama Department of Economic and Community Affairs
Alabama Department of Public Health
Alabama Department of Transportation
Alabama Forestry Commission
Alabama Historical Commission
Top of Alabama Regional Council of Governments

## 5.4 Individual Organizations

Nuclear Development, LLC

# CHAPTER 6 - LITERATURE CITED

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# Appendix A – Cultural Resources Consultation

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ALABAMA HISTORICAL COMMISSION

468 South Perry Street
Montgomery, Alabama 36130-0900
334-242-3184 / Fax: 334-240-3477

Lisa D. Jones
Executive Director
State Historic Preservation Officer

February 17, 2017

Michaelyn Harle
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Re: AHC 16-1318
Bellefonte Nuclear Reservation
Proposed Sale Phase I Archaeological Survey
Jackson County

Dear Ms. Harle:

Upon review of additional information forwarded by your office, we have determined that project activities, as proposed will have no effect on any cultural resources listed on or eligible for the National Register of Historic Places. Therefore, we concur with the proposed project activities. Please provide our office with a copy of the report on the geophysical testing at Fennell Cemetery when the study is complete.

Should artifacts or archaeological features be encountered during project activities, work shall cease and our office shall be consulted immediately. Artifacts are objects made, used or modified by humans. They include but are not excluded to arrowheads, broken pieces of pottery or glass, stone implements, metal fasteners or tools, etc. Archaeological features are stains in the soil that indicate disturbance by human activity. Some examples are post holes, building foundations, trash pits and even human burials. This stipulation shall be placed on the construction plans to insure contractors are aware of it.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact William Lowe at 334.230.2670 or William.Lowe@ahc.alabama.gov. Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford
Deputy State Historic Preservation Officer

LAW/WJL/wjl

**From:** Shuler, Marianne M
**To:** Dudley, Cynthia S; Yarnell, W Richard; Cole, Stephen C
**Subject:** FW: Bellefonte Nuclear Reservation Proposed Sale
**Date:** Monday, September 26, 2016 3:41:45 PM

Comments from EBCI.

**From:** Ezzell, Patricia Bernard
**Sent:** Monday, September 26, 2016 3:26 PM
**To:** Shuler, Marianne M
**Subject:** FW: Bellefonte Nuclear Reservation Proposed Sale

fyi

**From:** Holly Austin [mailto:hollymaustin94@gmail.com]
**Sent:** Monday, September 26, 2016 9:54 AM
**To:** Ezzell, Patricia Bernard
**Subject:** Bellefonte Nuclear Reservation Proposed Sale

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

Program Manager Ezzell:

The Eastern Band of the Cherokee Indian Tribal Historic Preservation Office (EBCI THPO) appreciates the measures taken by TVA in order to ensure the protection of our precious cultural resources. This office agrees with the measures taken in order to protect the eligible sites from disturbance or destruction. However, this office requests that the purchaser be made aware of the implications of disturbing NRHP eligible sites, and that they be provided with our contact information in the event that a site is inadvertently disturbed. We thank you for your continued support and stewardship of our cultural resources.

Sincerely,

--
Holly Austin
Federal Cultural Resource Law Liaison
Tribal Historic Preservation Office
Eastern Band of the Cherokee Indian
hollymaustin94@gmail.com
Ph: (828) 359-6854

**From:** Shuler, Marianne M
**To:** Ezzell, Patricia Bernard; McCampbell, Amy Boardman; Yarnell, W Richard; Cole, Stephen C
**Subject:** FW: TVA-Bellefonte Nuclear Reservation Sale, Jackson Co, AL 9-20-16
**Date:** Friday, October 14, 2016 11:35:53 AM

See comments from the Chickasaw Nation.

**From:** Karen Brunso [mailto:Karen.Brunso@chickasaw.net]
**Sent:** Friday, October 14, 2016 9:40 AM
**To:** Shuler, Marianne M
**Subject:** RE: TVA-Bellefonte Nuclear Reservation Sale, Jackson Co, AL 9-20-16

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

Good morning Marianne,
The Chickasaw Nation will defer on this project to the other tribes. Please let me know if there are any questions. Thank you and have a wonderful weekend.

**Karen Brunso**
Tribal Historic Preservation Officer
The Chickasaw Nation
Department of Culture & Humanities
Division of Historic Preservation
P.O. Box 1548
Ada, OK 74821-1548
Phone: 580-272-1106
Cell: 580-399-6017
Email: karen.brunso@chickasaw.net

**From:** Shuler, Marianne M [mailto:mmshuler@tva.gov]
**Sent:** Tuesday, September 20, 2016 2:43 PM
**To:** 'sheila-bird@cherokee.org' <sheila-bird@cherokee.org>; 'Eric Oosahwee-voss' <eoosahwee-voss@ukb-nsn.gov>; 'Holly Austin' <hollymaustin94@gmail.com>; HPO <HPO@chickasaw.net>; 'celestine.bryant@actribe.org' <celestine.bryant@actribe.org>; 'AQhpo@mail.com' <AQhpo@mail.com>; 'Llangley@coushatta.org' <Llangley@coushatta.org>; 'dc13.dc4@gmail.com' <dc13.dc4@gmail.com>; 'THPO' <thpo@tttown.org>; 'Section106' <Section106@mcn-nsn.gov>; 'Thrower, Robert (rthrower@pci-nsn.gov)' <rthrower@pci-nsn.gov>; 'Ken Blanchard (kblanchard@astribe.com)' <kblanchard@astribe.com>; 'Robin Dushane (RDushane@estoo.net)' <RDushane@estoo.net>; 'Kim Jumper (kim.jumper@shawnee-tribe.com)' <kim.jumper@shawnee-tribe.com>; 'Natalie Harjo (harjo.n@sno-nsn.gov)' <harjo.n@sno-nsn.gov>
**Cc:** Ezzell, Patricia Bernard <pbezzell@tva.gov>; 'Russell Townsend (RussellT@nc-cherokee.com)' <RussellT@nc-cherokee.com>; 'Leonard Longhorn (llonghorn@astribe.com)' <llonghorn@astribe.com>; 'Dee Gardner (dgardner@estoo.net)' <dgardner@estoo.net>
**Subject:** TVA-Bellefonte Nuclear Reservation Sale, Jackson Co, AL 9-20-16

**From:** Shuler, Marianne M
**To:** McCampbell, Amy Boardman; Yarnell, W Richard; Cole, Stephen C
**Subject:** FW: TVA-Bellefonte Nuclear Reservation Sale, Jackson Co, AL 9-20-16
**Date:** Thursday, October 27, 2016 9:52:32 AM

Comments from the Muscogee Creek Nation.

**From:** Section106 [mailto:Section106@mcn-nsn.gov]
**Sent:** Thursday, October 20, 2016 12:56 PM
**To:** Shuler, Marianne M
**Subject:** RE: TVA-Bellefonte Nuclear Reservation Sale, Jackson Co, AL 9-20-16

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

Marianne Shuler
Archaeologist
TVA Biological & Cultural Compliance
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Ms. Shuler,

Thank you for the correspondence regarding the proposed sale of the circa 1,600-acre Bellefonte Nuclear reservation. The project area located in Jackson County, Alabama is within our historic area of interest. The Muscogee (Creek) Nation is **unaware of any Muscogee cultural or sacred sites located within the immediate project area**. We concur that there should **be no historic properties affected**. We have no objection to the proposed sale. Please feel free to contact me with any further questions or concerns.

**Ms. Corain Lowe-Zepeda**
Historic and Cultural Preservation Department, THPO
Muscogee (Creek) Nation
P. O. Box 580
Okmulgee, OK 74447
T 918.732.7835
clowe@mcn-nsn.gov

**From:** Shuler, Marianne M [mailto:mmshuler@tva.gov]
**Sent:** Tuesday, September 20, 2016 2:43 PM
**To:** 'sheila-bird@cherokee.org'; 'Eric Oosahwee-voss'; 'Holly Austin'; 'HPO@chickasaw.net'; 'celestine.bryant@actribe.org'; 'AQhpo@mail.com'; 'Llangley@coushatta.org'; 'dc13.dc4@gmail.com'; 'THPO'; Section106; 'Thrower, Robert (rthrower@pci-nsn.gov)'; 'Ken Blanchard (kblanchard@astribe.com)'; 'Robin Dushane (RDushane@estoo.net)'; 'Kim Jumper (kim.jumper@shawnee-tribe.com)'; 'Natalie Harjo (harjo.n@sno-nsn.gov)'
**Cc:** Ezzell, Patricia Bernard; 'Russell Townsend (RussellT@nc-cherokee.com)'; 'Leonard Longhorn (llonghorn@astribe.com)'; 'Dee Gardner (dgardner@estoo.net)'
**Subject:** TVA-Bellefonte Nuclear Reservation Sale, Jackson Co, AL 9-20-16

# Appendix B – Public Comments and Responses

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# APPENDIX B - PUBLIC COMMENTS AND RESPONSES

## A. INTRODUCTION

A Draft Environmental Assessment (EA) for the proposed Bellefonte Property Disposal was released for comment on March 31, 2017. The comment period closed on May 1, 2017. The Draft EA was transmitted to various agencies and organizations. The Draft EA was posted on TVA's public National Environmental Policy Act (NEPA) review website. A notice of availability, including a request for comments on the Draft EA, was published in newspapers serving the Jackson County, Alabama area. Comments were accepted through May 1, 2017, via TVA's website, mail, and e-mail.

A total of 30 comment letters, emails, and online comments were received from 28 individuals and organizations. Two individuals/organizations provided more than one submission. All letters and emails received during the comment period are included at the end of this appendix. Of the 28 individual people and organizations that commented, 20 expressed support of the sale for various reasons, four were opposed to the sale for various reasons, and the remaining four had other comments. The comment submissions were carefully reviewed and subdivided into distinct comment statements. The comments and responses are compiled into broad topics (Support for the Sale, Opposition to the Sale, and Other Topics) and then into more specific issues within each of these topic categories. A total of 50 comment statements were identified from the 30 submitted comment letters, emails, and online comments. Similar comment statements were grouped together into 27 comment topics/issues (for example, 10 individual comments were received that simply expressed support for completion of the sale of the BLN Property). TVA's responses to the topics and issues raised in the comment submissions are provided below.

## B. Comments in Support of Alternative B – Complete the Sale of the BLN Property to Nuclear Development, LLC

**Comment 1:** Complete the sale of the BLN Property to Nuclear Development, LLC. (*Commenters: Joe Baumgardner, boismebutler, Glenn Butler, Matthew Danner, Ken Frizzell, Thomas Goff, Tommy D. Golston, Jim Reid, Norris Johnston, Jack Keeling, Dale Kittle, M.L. Lansdell, Roy Light, Jack Livingston, David McDougal, Robin Murphy, Tiffany Payne, Melanie Phillips, Martin Pierce, and Robert Shelley*)

> **Response:** Comment noted. Alternative B, completing the sale of the property to Nuclear Development, LLC is TVA's preferred alternative.

**Comment 2:** Completing the sale has beneficial impacts to Jackson County, Alabama through the creation of new jobs in the community which are very much needed. More local, technical jobs would also shorten the commute times for some who live in the area but are only able to find similar work some hours away. It would also provide opportunities for career growth for TVA contractors without options for getting TVA jobs. (*Commenters: Joe Baumgardner, Glenn Butler, M. L. Lansdell, Robin Murphy, and Melanie Phillips*)

**Response:** Comment noted. Section 3.19.2 addresses impacts to employment as a result of implementation of the project alternatives.

**Comment 3:** Completing the sale has beneficial impacts to the local area, the state, and the nation in the form of a reduction in the carbon footprint. The environmental impact will be insubstantial to negligible, and the benefits of completion and operation will be positive and beneficial. The country needs more clean, dependable energy like this would provide along with the countless financial benefits to the local economy for both the short and long terms. All aspects of the transfer/operation of the property will be managed in accordance with the latest and best technology designed to minimize the environmental impact of such activity. The safety regulations in place by the federal government will assure the completion of any nuclear plant will meet all safety standards. (*Commenters: Joe Baumgardner, Thomas Goff, Norris Johnston, Jack Livingston, Martin Pierce, and Robert Shelley*)

**Response:** Comment noted. Subsection 3.11.2 discusses the impacts to climate change associated with the project alternatives.

**Comment 4:** Complete the sale as long as the project is finished resulting in lower utility costs, employment opportunities for locals, and the new management becomes part of the community by supporting the community and investing in and sponsoring local rec centers with part of their profits. (*Commenter: Tiffany Payne*)

**Response:** TVA has no current plans to purchase power from Nuclear Development. Since TVA determined it does not have a need for additional large sources of baseload energy over the next 20 years, the power generated by this plant would presumably be sold outside of the Tennessee Valley Region and therefore TVA expects that it would not adversely affect TVA power rates. The purchase contract requires the purchaser (Nuclear Development, LLC) to make a cumulative total expenditure of $25 million in capital improvements at the BLN Property or other areas in Jackson County, Alabama in connection with development of the BLN Property within five years after the close of the sale. Any utility costs or additional investments in the local community would be determined by Nuclear Development after the site becomes operational. TVA would have no input into these decisions after the completion of the sale.

**Comment 5:** The property has been approved for a nuclear use for decades. TVA has indicated it does not intend to further develop the site. The sale should be completed so the site can finally be put to use after all the time, money, and effort invested in it over the years. Allow someone to finally finish this project that already has so many tax dollars invested, no matter who owns it. (*Commenters: Jack Livingston and Martin Pierce*)

**Response:** Comment noted.

**Comment 6:** Complete the sale. However, the proposed future use of the site for completion of the nuclear units will not be realized as has been seen with the AP1000 Nubuilds at Summer 2&3 and Vogtle 3&4. Consider the sale as getting rid of unnecessary property that will gradually

deteriorate, and, if retained by TVA, require demolition. What the new owner does is immaterial. (*Commenter: Jack Keeling*)

**Response:** Comment noted.

## C. Comments Against Completing the Sale of the BLN Property to Nuclear Development, LLC

### *i. General Comments in Opposition to Completing the Sale to Nuclear Development*

**Comment 7:** Completing the sale to Nuclear Development undermines jobs of others in the area to make power and would be detrimental to the TVA service area which is already in competition with the Memphis Power Company. The competition has been described as a reason for why TVA's sales have declined. Additionally, TVA has to compete in costs with Memphis to prevent losing more business. (*Commenter: Debra Johnson*)

**Response:** Comment noted. Memphis Light, Gas, and Water Division (MLGW) is a local power company that provides distribution of TVA-generated power to its retail customers. As TVA's largest customer, rather than a competitor, MLGW's full requirements for electricity are met by TVA.

**Comment 8:** The sale value is too far off market value and this is public property which could be used for TVA storage, research, and training. Too much public money has already been spent on the property and been wasted on back and forth decisions whether or not to finish the site. (*Commenter: Debra Johnson*)

**Response:** TVA hired an appraiser with extensive experience in the valuation of nuclear power generating facilities. Market value was established by the appraiser and was used to set TVA's minimum bid price at auction. The final bid received at auction was well above the estimated market value. TVA is also reducing costs by aligning its real estate with current and future business needs.

**Comment 9:** The sale is a major betrayal of the people in the area, and not the only such betrayal. The site was built several years ago but never used because TVA says we do not need the electricity for this area. If so, then why was millions of dollars of taxpayer money spent to build a facility we do not need? TVA has now sold the plant and site to Nuclear Development who plans to manufacture power and sell it up north while Jackson County, Alabama, has to deal with having the danger of nuclear radiation locally. (*Commenter: Ila Faye Wheeler*)

**Response:** Capital to build or purchase generating assets (such as BLN) is provided by power bonds to be repaid through sales of electricity (ratepayers) and not tax revenue. As described in Section 1.1 of the EA, TVA's power generation needs have changed since the various iterations of the project were originally proposed. While the site would otherwise have strategic value to TVA as a possible location for a large generation facility, TVA determined in its 2015 *Integrated Resource Plan* that it likely would not have

a need for such facilities for the next 20 years. One of TVA's goals for the sale was to determine if TVA would better serve the public by retaining control of the site or proceeding with the sale. The purchase contract requires that the purchaser make a cumulative total expenditure of $25 million in capital improvements at the BLN Property or other areas in Jackson County, Alabama in connection with development of the BLN Property within five years after the close of the sale. If the required capital improvements are not made, TVA has the right to retake possession of the BLN Property.

### *ii. Comments Opposing the Sale to Nuclear Development and Proposing TVA Retain the Property for Other Uses*

**Comment 10:** TVA has plans in place for small modular reactors, why not utilize property TVA already owns. (*Commenter: Debra Johnson*)

**Response:** TVA has considered several locations for small modular reactors, and determined that the Clinch River Site was the preferred alternative to consider for this purpose as evaluated in the *Clinch River Nuclear Site Early Site Permit Application Part 3 Environmental Report* (May 2016). TVA's early site permit application for Clinch River discusses small modular reactor site selection.

**Comment 11:** With the suspension of coal regulations, coal will become a viable source of energy. Natural gas is unstable and fracking causes earthquakes. TVA should keep alternative areas such as this for expansion to keep its coal plants in operable status. (*Commenter: Debra Johnson*)

**Response:** Comment noted.

**Comment 12:** None of us really own any land. We are just the caretakers entrusted with caring for the land and passing it on to future generations. By rights this land should be returned to the family of Mary Texas Hurt. TVA used the eminent domain process to take this property and Mary Texas Hurt fought the seizure until she died. (*Commenter: Illa Faye Wheeler*)

**Response:** TVA paid fair market value for the property when it was acquired and complies with applicable law including the TVA Act when selling real property declared as surplus at public auction to the highest bidder.

**Comment 13:** TVA should cancel and withdraw from the sale and use the site for significantly less hazardous, dangerous, and environmentally impacting electric power generation that is also less expensive to build and operate as well as higher capacity and faster to build. This would be a more viable and preferred alternative to a nuclear power plant. TVA should sell the equipment to the National Environmental Group from India who was the second runner up in the auction. The equipment would then be shipped to India for use in that nation while also bringing funds into TVA. TVA should then utilize the Bellefonte site for a plant based on induction energy. This would provide both jobs and energy at the site while also becoming operational

much sooner than a nuclear facility could. Phoenix Energy is willing to provide information about a design for this form of energy generation at request. (*Commenter: Phoenix Energy, LLC*)

> **Response:** The auction was open to all interested bidders who could complete a qualification process to demonstrate the financial capability to pay the minimum bid price and meet the minimum investment requirements. The terms of the auction did not proscribe a specific proposed use of the property. As described in Section 1.1 of the EA, TVA's power generation needs have changed since the various iterations of the project were originally proposed. While the site would otherwise have strategic value to TVA as a possible location for a large generation facility, TVA determined in its 2015 *Integrated Resource Plan* that it likely would not have a need for such facilities for the next 20 years. Should the sale not be completed, TVA would exercise Alternative A, the No Action Alternative, and would continue to maintain the site. Based on the findings in the EA, TVA concludes that Completion of the Sale of the BLN Property would not significantly affect the environment.

### *iii. Safety Related Opposition to Completing the Sale to Nuclear Development*

**Comment 14:** Nuclear power is obsolete. In the future it will be considered too dangerous and too costly to engage in. We are capable of producing all the energy we need without resorting to nuclear radiation. (*Commenter: Ila Faye Wheeler*)

> **Response:** Comment noted. Subsection 3.18.2 presents the analysis regarding potential radiological effects of normal operations.

**Comment 15:** Please do not allow anyone to place nuclear material in that decrepit facility at Bellefonte, Alabama. The facility's 1970s vintage design, primary plant system, equipment, containment, and infrastructure area is antiquated, mostly obsolete, and has been superseded by nuclear management, structural, controls, sensing, monitoring, and safety system designs and equipment. Additionally there are multiple and various significant adverse ecological and atmospheric environmental impacts, hazards, dangers, and costs to the site, local communities and residential properties, workers, residents, waterways, and watersheds. These impacts are associated with the long-term and possible indefinite onsite storage of irradiated and spent radioactive fuel cells and rods as well as the handling, processing, transportation of low level radioactive materials and wastes. Such radioactive wastes are a growing concern and problem for the United States, especially for the Southeastern U.S. due to the number and concentration of nuclear power plants in this area. (*Commenters: Judith Bay and Phoenix Energy, LLC*)

> **Response:** Comment noted. Commercial nuclear power plants in the United States are licensed and regulated by the NRC. Should it decide to complete and operate the plant, it is expected Nuclear Development would comply with the NRC's safety and environmental requirements for the construction and operation of a nuclear facility, including long-term storage of radioactive waste.

**Comment 16:** All nuclear power plants are dangerous, but Bellefonte is subject to special dangers like earthquakes and limestone. In March 2017, the northern Alabama area experienced another small earthquake in a series of three or four. The New Madrid fault lies just to the west in Mississippi. Though not active for a long time, this fault has produced some of the worst earthquakes when it was active. Limestone rock is porous and easily erodible resulting in the production of caves, several of which are found in the area including across the river from Bellefonte. The cave across the river has unique features and natural and cultural resources that should be preserved. (*Commenter: Ila Faye Wheeler*)

> **Response:** See response to Comment 15. NRC's safety regulations include geologic stability requirements with respect to seismic conditions and underlying bedrock stability. As a federal agency, NRC is required to comply with the National Environmental Policy Act (NEPA) in considering whether to issue permits and licenses. The land across the river is not proposed for sale as part of this action.

**Comment 17:** I oppose nuclear power. Chernobyl and Fukushima were total disasters. Browns Ferry in Alabama, had near misses with a fire in 1975 and tornadoes in April 2011. TVA was cited for loss of power for more than 15 minutes. It took them 12 hours to get things under control and it is unknown how long to get the power back. France and Germany have been phasing out nuclear power and are not creating any new nuclear sites. Why can't the U.S. do the same? There are many alternative power sources available. No one knows how to dispose of nuclear waste and cannot contain nuclear materials in an emergency such as Chernobyl or Fukushima. (*Commenter: Judith Bay*)

> **Response:** See response to Comment 15. Browns Ferry Nuclear plant shut down safely, as designed, when the site briefly lost its external electricity supply due to tornadoes on April 27, 2011. Emergency backup power systems, including diesel generators, immediately began working and continued to operate as a precaution after outside power was restored. The plant and its safety systems performed well.

**Comment 18:** Not only would a nuclear power plant create radiation and nuclear waste, but it would require miles and miles and acres of land for high voltage transmission lines to carry the electricity to locations far away. There is no way the electromagnetic energy emitted by the high voltage power lines can fail to influence every single aspect of our body's physical and mental activities. My neighbor's family has experienced serious health concerns which I believe are associated with the high voltage power lines located very near their houses. Studies should be done to determine the effects of these electromagnetic fields on people and on cancer. The electricity can also arc to very tall metal equipment or trees. The transmission lines are also a hazard to aviation for those trying to crop dust their fields in which the transmission lines are located. Maneuvering farming equipment around the towers is also difficult. If farmers do not maintain their fields under the lines, TVA helicopters spray herbicides which affect the land and orchards nearby. There should be compensation for those that live under these lines. Some countries bury transmission lines underground which prevents outages due to wind and weather saving billions in repairs. This also improves aesthetic qualities and protects human health. This is all another reason this plant should not be completed. TVA and Nuclear Development are

blinded by money. Nuclear power plants are obsolete and are too dangerous a practice to engage in. (*Commenter: Ila Faye Wheeler*)

> **Response:** See response to comments 14, 15 and 16. For information about electromagnetic fields (EMF), please see: https://www.tva.com/Energy/Transmission-System/Right-of-Way-Maintenance/Magnetic-and-Electric-Fields.
>
> For more information about TVA's right-of-way vegetation maintenance program, please see: https://www.tva.gov/Energy/Transmission-System/Right-of-Way-Maintenance/Safe-Herbicide-Application.

## D. Other Comments

**Comment 19:** What company has shown an interest in the nuclear plant and for what purpose? That must be answered in full before any sale occurs. Will the new owner's plans involve finishing the plant to produce power and if so, why would TVA sell it to a private firm who would charge more for this power than TVA would to its current customers? (*Commenter: Michael K. Smith*)

> **Response:** See response to comment 4. As described in the EA, Nuclear Development, LLC was the successful bidder and it has proposed to complete and operate the nuclear units currently present on the site. TVA has no current plans to purchase power from Nuclear Development. Nuclear Development is a private firm and would determine the market where the electricity is provided as well as the rates.

**Comment 20:** Have cumulative effects of the sale been addressed in the EA? (*Commenter: Lavaughn Hamblin*)

> **Response:** Yes, cumulative effects of the sale were addressed in Section 3.20 of the Draft and Final EA.

**Comment 21:** If the sale is not completed, TVA should clear and clean the area, return it to greenspace, and donate the land to the City of Scottsboro and Jackson County. (*Commenter: boismebutler*)

> **Response:** Comment noted.

**Comment 22:** If the sale is not completed, TVA should complete and operate BLN because of the significant investment to date and beneficial environmental impacts from the clean electricity it can provide. (*Commenter: Matthew Danner*)

> **Response:** As described in Section 1.1 of the EA, TVA's power generation needs have changed since the various iterations of the project were originally proposed. While the site would otherwise have strategic value to TVA as a possible location for a large generation facility, TVA determined in its 2015 *Integrated Resource Plan* that it likely would not have a need for such facilities for the next 20 years. Should the sale not be

completed, TVA would exercise Alternative A, the No Action Alternative, and would continue to maintain the site.

**Comment 23:** Do past sales of large tracts of TVA land play into this EA? Some sites such as Hartsville, Yellow Creek, and Phipps Bend have been sold off and resulted in short term projects or projects that were not completed. Is there any way to include in the bidding on large land tracts a guarantee that if the site is not turned into a beneficial concern (i.e. financially, socially, environmentally, etc.) it returns to TVA or is sold for a competitive price to another entity? This would aid in the growing of opportunities and fiscal stewardship of TVA's resources to prevent a potential adverse impact from similar sales such as Hartsville and Yellow Creek. (*Commenter: Tom Ryan*)

**Response:** No, former land transactions do not play a role in this EA. However, the purchase contract requires that the purchaser must make a cumulative total expenditure of $25 million in capital improvements at the BLN Property or other areas in Jackson County, Alabama in connection with development of the BLN Property within five years after the close of the sale. If the required capital improvements are not made, TVA has the right to retake possession of the BLN Property.

**Comment 24:** A nuclear plant should also be built at Yellow Creek and Colbert. (*Commenter: M.L. Lansdell*)

**Response:** Comment noted. Comment is beyond the scope of this proposed action. As described in the response to Comment 22, TVA does not foresee the need for additional baseload power generation sources over the next 20 years.

**Comment 25:** Skeptical that a real estate developer with no prior nuclear experience would actually go into the power generation business. (*Commenter: Patrick Guinn*)

**Response:** Comment noted.

**Comment 26:** The money previously invested in the site by TVA (and therefore by the American people) has been wasted because the site has never produced power. This is seen as a criminal action of those in charge of the project. Will all the cost that went into this plant be recouped from the sale or will TVA take a loss due to the sale? If there is a loss this would add to the proof of mismanagement of TVA and the US Government which has overseen this operation. The sale of this asset will be watched closely by the American people because it shows the decades of government mismanagement and misuse of funds and TVA incompetence. It also shows EPA's overstepping its powers and changing rules and regulations on a whim since EPA is against any more nuclear plants being built. The American people want accountability for the misuse of public funds and trust. The American people should come out the winner on this deal or else that plant should be providing electric service to homes and industry across the Southeastern US. (*Commenter: Michael Smith*)

**Response:** Comment noted. See response to Comments 8 and 9. The TVA Act allows the United States to consider sale of the real property in its possession. TVA follows

applicable laws, including environmental laws and regulations. Decisions related to the construction of nuclear plants are coordinated through the NRC.

**Comment 27:** There have been several tractor and trailer loads of scrap rolling out of the site since the announced sale. It appears the site is being cannibalized by the buyer, to their enrichment and to the detriment/loss of the tax payers. (*Commenter: Patrick Guinn*)

**Response:** TVA has used the Bellefonte site to warehouse equipment and supplies to be used at other TVA facilities. Under the terms of the sale, TVA has to remove all stored supplies and equipment before the sale closes. Therefore, TVA is moving these items to other TVA storage facilities.