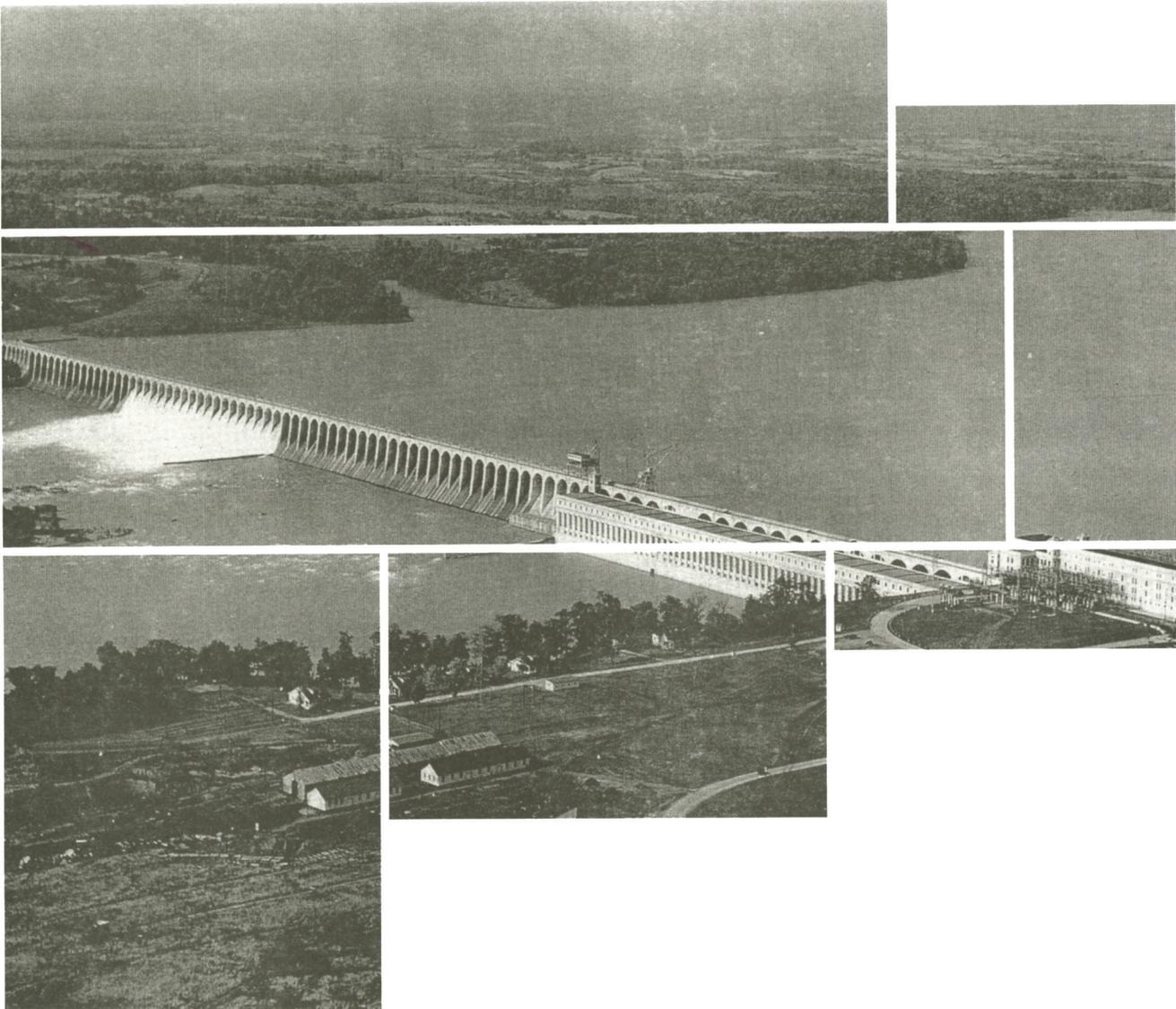


# Muscle Shoals/Wilson Dam Reservation Land Use Plan

*Final Environmental Assessment*





FINAL ENVIRONMENTAL ASSESSMENT

MUSCLE SHOALS/WILSON DAM  
RESERVATIONS LAND USE PLAN

TENNESSEE VALLEY AUTHORITY

NOVEMBER 1996

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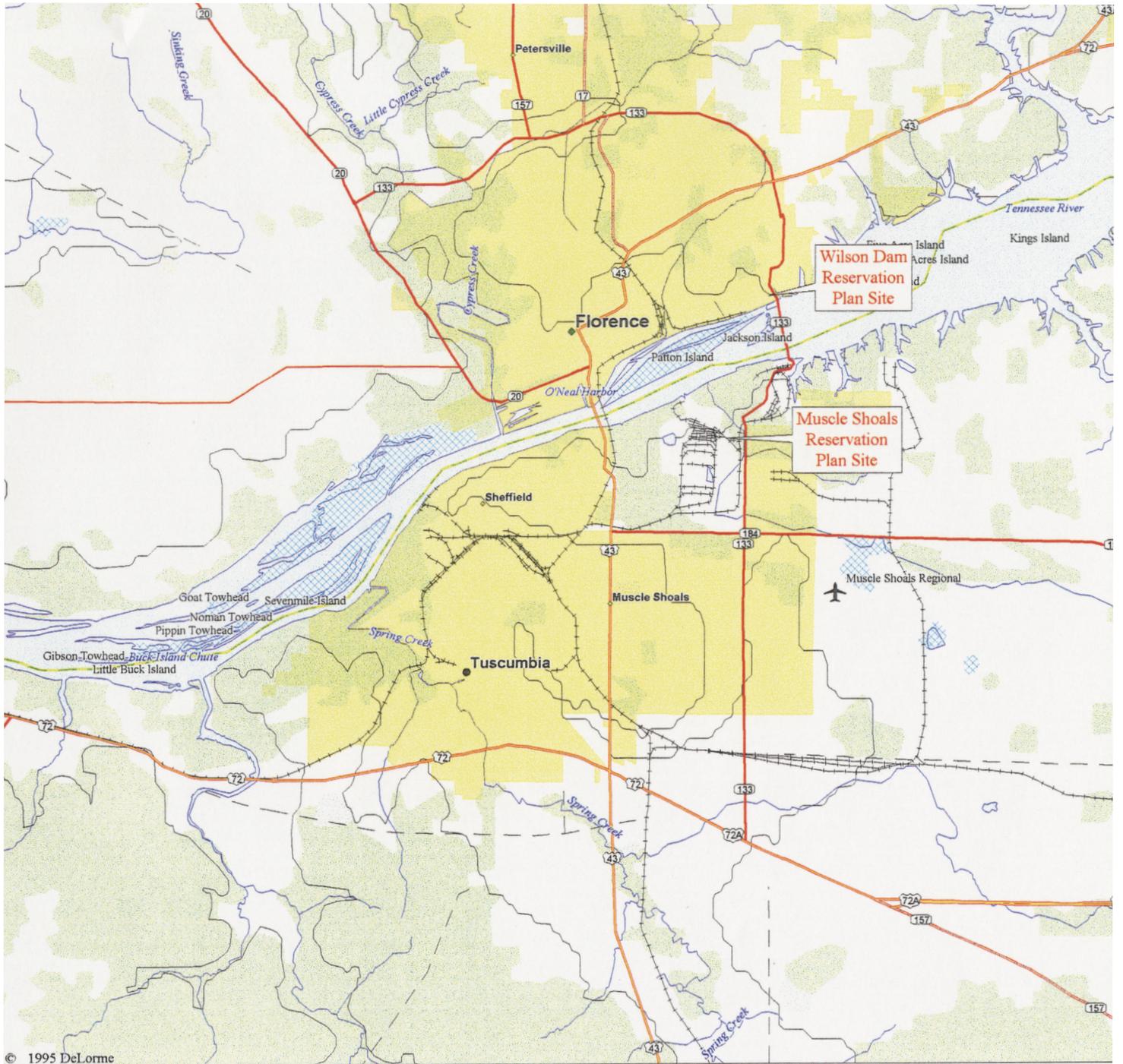
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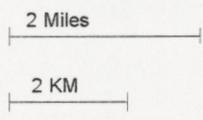


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## Vicinity Map

Mag 12.00  
Tue Nov 05 15:07 1996

Scale 1:125,000 (at center)



- Major Connector
- State Route
- US Highway
- Primary State Route



# CHAPTER 1

## 1.0 Purpose and Need for Action

TVA acquired control of the Muscle Shoals and Wilson Dam reservation properties, consisting of about 1228.7 hectares (3036 acres), from the United States War Department in 1933. During the past few years, TVA has received a variety of proposals for development and use of the two reservation properties by nonfederal entities. For example, TVA has received a proposal from the city of Sheffield for commercial development of a portion of the Muscle Shoals Reservation; proposals from the Shoals Chamber of Commerce, Shoals Economic Development Authority (SEDA), and the University of North Alabama (UNA) for construction of office buildings; and a proposal from the city of Muscle Shoals for construction of public and commercial buildings on the Muscle Shoals Reservation.

Some of these proposals, such as the one from Sheffield, identified specific sites and contained detailed plans. Other proposals were more general. The specific proposals, as presented to TVA, are detailed below. TVA considers all such unsolicited proposals as negotiable concepts, and did not evaluate as alternatives those that conflicted with TVA needs. Rather than try to accommodate these requests, TVA decided to first determine how much of the reservation was needed for TVA use, and then to identify portions of the Muscle Shoals and Wilson Dam Reservations that could be made available to others to meet non-TVA needs.

## 1.1 Public and Agency Scoping Comments

TVA's Muscle Shoals Land Management Office mailed over 386 letters to individuals and organizations, inviting citizens to provide comments during a period between May 16 and June 5, 1996. In addition, TVA Media Relations distributed press releases to nine newspapers, four television stations, and eight radio stations. Selected TVA staff also contacted by telephone or in person several local officials. A total of 14 letters and 31 telephone calls were received by TVA, including letters from local governments and prospective land users.

The majority of those who commented requested that the land not be developed. Also, a number requested that recreation be the primary use of the land. Several respondents requested more recreational facilities for a variety of uses. However, a number of those responding also supported future development of the reservation lands.

In addition, comment letters were received from the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corps of Engineers (USACE). The USFWS encouraged TVA to retain its lands and pointed out that wetlands and several federally listed

threatened and endangered species may occur in the area. The USACE supported the land use planning effort, but did not provide an opinion on whether to provide portions of the reservation for use by others.

## **1.2 External Proposals**

### **1.2.1 Sheffield Proposals**

Sheffield, Alabama, has submitted two alternative proposals for the same tract of land. These are referred to as “Sheffield A” and “Sheffield B.” Both would affect 100 acres of TVA’s Muscle Shoals reservation property on Hatch Boulevard. The site is bordered by Reservation Road, Garage Road, and Hatch Boulevard.

Sheffield A and Sheffield B identified in the proposed master plan are similar. The only difference between the two schemes are: Scheme A shows a 60-home residential component while Scheme B provides a larger recreation health club, and sports complex concept with no residential development. These proposed components are located within the northeast quadrant of the site and occupy approximately one third of the total land base requested.

Both Scheme A and B show an office development complex west of Hatch Boulevard. This would complete the final build out of the land owned by TVA and is currently allocated to the city of Sheffield. The parcel is located just north of the Holiday Inn. The master plan also incorporates the use of the abandoned Southern Railroad corridor (north-south) as a pedestrian trail and greenway. This greenway is proposed to link with the existing recreational trail system located to the east on the TVA reservation.

Both concepts also contain a proposal for a fire station to better serve the entire area. Another cluster of buildings common to both schemes are recommended to facilitate local government or community operations. This complex abuts the existing utility corridor (east-west) at the northern end of the site with primary access currently designed from Reservation Road.

There are three other development components common to both schemes. The primary component is a large retail center serving as the main catalyst for the overall project. The major tenants are envisioned to be a large grocery store and adjacent upscale outlet mall similar to the “Warehouse Row” concept developed in Chattanooga, Tennessee. Most of the parking for this complex would be located behind the mall and east of Hatch Boulevard. The primary entrance to the retail mall area would be from Garage Road. A secondary entrance would be from Reservation Road.

The second component common to both schemes is a central boulevard of specialty retail shops and services. Most parking would be found behind the buildings and along the boulevard.

The third component common to both schemes is a small office complex. These buildings are expected to attract physicians, lawyers, and other small professional businesses. In addition, emphasis would be placed on recruiting state, federal, and other public agencies to establish offices within the central area of the site. Some of the office space would be interspersed among the retail sections while others would be clustered together as currently located to the north, adjacent to Reservation Road.

A consistent architectural theme for creating a feeling of small town store fronts is anticipated to enhance the market position and blend with the traditional neighborhood concept. Also common to both schemes is a strong commitment for keeping a dense vegetative screen along Reservation Road and a 100-foot modified (thinned understory) buffer along Hatch Boulevard. Trees and other vegetation plantings are recognized as essential throughout the development proposal.

### **1.2.2 Shoals Economic Development Authority (SEDA) and Shoals Chamber of Commerce**

Shoals Economic Development Authority (SEDA) located in Florence, Alabama, has inquired about using TVA land located on Muscle Shoals and Wilson Dam Reservations for construction of an office building to serve as its new headquarters. Two sites were identified, one located roughly on the north corner of the Hatch Boulevard/Main Reservation Road Intersection that now serves as the main entrance to the Muscle Shoals Reservation. The other proposed site is located near the Renaissance Tower off Wilson Dam Road. SEDA's inquiry was prompted by its need to find new quarters after learning its present office space in a University of North Alabama building will no longer be available to the agency.

SEDA works toward improving the economy of the Shoals area through recruitment of new industry and providing assistance to existing businesses that wish to expand operations. SEDA is governed by a 24-person board. The Board includes representatives from Colbert and Lauderdale Counties and the cities of Florence, Muscle Shoals, Sheffield, and Tuscumbia.

The Shoals Area Chamber of Commerce has also requested that TVA make approximately three acres of land available on the Wilson Dam Reservation for an office building. The new office would be used to carry out their responsibilities as a non profit, regional development organization. The Chamber proposes to build an 8,000-square-foot structure north of the Wilson Dam Lock entrance road. A site selection task force made up of Chamber members identified two sites belonging to TVA which met their selection criteria. The alternate site is located on the Muscle Shoals Reservation in the general area between the Ramada Inn and Second Street. No other sites were identified.

The Chamber has about 1000 members and performs such activities as sponsoring youth and adult training programs, assisting in the establishment of community development programs and assisting other developmental organizations in marketing sites in the Shoals

area that are available for economic development. The Members represent a number of businesses in the Colbert/Lauderdale area.

### **1.2.3 River Heritage**

The City of Florence is discussing proposals to include a part of the Wilson Dam Reservation in a public use development project which extends along the Florence waterfront from the Conference Center adjacent to Wilson Dam to O'Neal Harbor at McFarland Park. The City proposes to construct walking trails, an amphitheater, a wildflower meadow, and related facilities such as lights, rest rooms and seating. The project would cost in excess of \$2,000,000 and is being financed through federal grants and local revenues.

### **1.2.4 City of Muscle Shoals**

The City of Muscle Shoals has indicated that it would like to use land located on the Muscle Shoals Reservation, to facilitate current and future growth of the City. To support this growth, the City anticipates needing sites on the reservation for a fire station, elementary school, recreation facilities, professional/office space, retail space, and other mixed uses. The fire station would be located north of River Road near TVA's Power Service Shops; the school, at the corner of Second Street and Wilson Dam Road; and recreation facilities, commercial development and other mixed uses would be located on the south perimeter of the reservation along Second Street, between Hatch Boulevard and Wilson Dam Road.

## **1.3 Muscle Shoals Flood Reduction Project**

While the Muscle Shoals/Wilson planning effort was underway, the U.S. Army Corps of Engineers issued an Environmental Assessment on flood reduction alternatives for the Buena Vista Retention Pond in Muscle Shoals. The proposed solution to flooding in the area involved excavating the existing retention pond and increasing the pumping capacity. Excess water would be pumped onto the southern end of the Muscle Shoals Reservation, north of the junction of Second Street and Broadway, for eventual drainage into Pond Creek. If approved, this project could cause additional flooding on the southern portions of the reservation and affect the feasibility of alternative uses along Second Street.

## CHAPTER 2

### 2.0 Alternatives

TVA formulated three alternative plans for uses of the Muscle Shoals and Wilson Dam Reservations. These are described below and are shown on maps Alternatives 1-3.

#### 2.1 Alternative 1 - No Action

Under this alternative, TVA would not produce a plan. Requests for additional uses of land by TVA organizations, partnerships, and external organizations would be considered on a case-by-case basis.

#### 2.2 Alternative 2 - TVA Program Use and Regional Development

Under this alternative, the largest portion of the reservation acreage would continue to be used for TVA programs, including recreation. The TVA land assignments are described in Section 2.4. TVA would accept and review requests for use of two tracts of land by regional development agencies, government agencies, and educational organizations. TVA has reviewed the sites where the external requests were proposed (see Section 1.2). The presence of cultural resources, solid waste management units, wetlands, and the preference of commenters for preserving the bulk of the reservation lands for public recreation uses were considered along with TVA's needs in determining which lands could be made available. The presence of these resources and TVA's needs led TVA to eliminate all but two tracts--one in the southwest corner of the Muscle Shoals Reservation and one near the Renaissance Tower in the northwest corner of the Wilson Dam Reservation. Thus, the request from Shoals Chamber of Commerce/SEDA/UNA would be considered, as well as other proposals which do not conflict with TVA needs.

TVA would also reserve additional areas north and south of Reservation Road, along the Florence waterfront, and near Fleet Harbor for open space and recreation. Visual buffers would be established along major roads, and a 30.5-meter (100-foot) wide vegetative buffer would be established along each side of Pond Creek.

Sites used by Fossil & Hydro Power on the northeast side of the Muscle Shoals Reservation and the south part of Wilson Dam Reservation would continue to be available for utility-related uses. In addition, the railroad to these sites would be allocated for use by Fossil & Hydro Power.

### **2.3 Alternative 3 - TVA Program Use (Including Public Recreation)**

Under this alternative, TVA would maintain areas north and south of Reservation Road, a Florence waterfront area, an area near the Renaissance Tower in the northwest corner of the Wilson Dam Reservation, and an area near Fleet Hollow for public recreation and open space. Visual buffers would be established along major roads, and a 61-meter (200-foot) wide vegetative buffer would be established along the Pond Creek corridor. All TVA program uses cited in Alternative 2 would also apply to this alternative. The 3.70 hectares (9.14 acres) at the corner of Hatch Boulevard and Second Street would be unassigned for TVA program uses.

### **2.4 Preferred Alternative**

TVA prefers alternative 2. Based on the process of identifying TVA needs and then determining if lands are available for external uses, two sites (a 3.7-hectare [9.14-acre] site in the southwest corner of the Muscle Shoals Reservation and a 1.2-hectare [3.0-acre] site north of the Tennessee River) have been identified that potentially could be made available for non-TVA use. The largest portion of the reservation acreage would continue to be used for TVA program uses, including recreation. Visual buffers would be established along major roads, and a 30.5-meter (100-foot) wide vegetative buffer would be established along each side of Pond Creek.

In addition, the following lands would be assigned to TVA businesses:

#### TVA Environmental Research Center

The Environmental Research Center (ERC) currently has 238.8 hectares (590 acres) of land assigned to its business. An additional 142 hectares (351 acres) would be assigned to it to meet its current and future business requirements.

#### TVA Power Service Shops

TVA Power Service Shops (PSS) has identified a 22.3-hectare (55-acre) parcel of land needed for future use in addition to the approximately 31.2 hectares (77 acres) located just south of Wilson Dam Reservation which is now assigned to the shops. This parcel is bound on the east by Wilson Dam Road and on the north by Reservation Road. It would be reserved for future construction of additional PSS that could possibly include a facility to service nuclear operations equipment with related storage and buffer zone.

#### Recreation

Approximately 350.2 hectares (865 acres) would be allocated to provide recreational opportunities for the public. Major features include a trails complex that has received National Recreation Trails status; a small wild area set aside for its diversity of plant life; two popular boat launching ramps; and camping and picnicking facilities. In addition, the

predominantly undeveloped natural character of this area presents a scenic setting for the heavily traveled Reservation Road.

#### Corporate Facilities

Approximately 16.2 hectares (40 acres) would be allocated for operation and maintenance of existing corporate facilities. These include: the TVA Medical Office, the Office Service Warehouse complex, offices for the Customer Group and Transportation Services, the ERC office complex, Services building, and Chemical Engineering building.

#### Miscellaneous Facilities

The balance of the 1224 hectares (3023 acres) not accounted for above is allocated for roads, utilities, and other miscellaneous TVA uses.



## CHAPTER 3

### 3.0 Affected Environment

#### 3.1 Cultural Resources

A Cultural Resources Assessment has been performed for the Muscle Shoals and Wilson Dam Reservations (Shaw, 1994). National and regional historically significant sites have been identified on the reservations. The National Historic Preservation Act of 1966 and the Archaeological Resources Protection Act mandate that TVA protect archaeological and historic sites and structures (cultural resources) on its property or on property affected by its projects. The following sections provide specific information about the cultural sites on the Muscle Shoals and Wilson Dam Reservations that must be protected or mitigated should a development alternative be chosen.

##### 3.1.1 Prehistoric Sites

There are several prehistoric archaeological sites located on the reservations; however, only three of these have been identified as significant or potentially significant prehistoric archaeological sites.

##### 3.1.2 South Port Area

The site of the early nineteenth century town of South Port is located on the western edge of the Muscle Shoals Reservation. Initial development began around 1813; and South Port had residences, warehouses, and transportation facilities such as a ferry and a railroad. Today the only structure remaining of the South Port era is the railroad trestle. A cemetery located along the southern boundary of South Port contains at least one grave marker with a date of 1851. This date puts the cemetery in association with the later time frame of South Port. The cemetery is located on the South Port Historical Trail and has an interpretive marker. Another cemetery, the Cockburn Cemetery (located near the Credit Union), is recognized as the burial site of some of the South Port inhabitants.

##### 3.1.3 Civil War Sites

Since the Tennessee Shoals offered a good crossing point, it is no surprise that there was Civil War activity in the area. There is a record of a troop gathering at south Florence (South Port) on November 20, 1864, prior to a march to Franklin, Tennessee. Other reports exist detailing activities in the area, which included raids, river crossings, and encampments. There are four potentially significant Civil War sites located on the reservations, and all would require more work to determine their significance.

### 3.1.4 War Department Construction Sites

The early 1900s saw a dramatic increase in activity on what is now the Muscle Shoals Reservation. This effort was spearheaded by an order from President Wilson to harness Tennessee River energy through the construction of Wilson Dam. While the dam was being constructed, the Wilson Steam Plant was built to provide power for the nitrate plant for munitions development. Today ten sites built by the War Department remain and are listed in or are potentially eligible for listing in the National Register of Historic Places:

- Wilson Dam, first started in 1918 to provide power to the nitrate plants, was completed in 1925. It is significant in that the dam represents a monumental effort by the War Department to tame the power of the Tennessee River. The dam is almost 30.5 meters (100 feet) high and approximately 1.2 kilometers (3/4 mile) in length. In it are contained the turbines necessary for power production. Two single lift locks are located on the north end of the dam. Wilson Dam is recognized as a historic site by the National Register of Historic Places and has been designated a National Historic Landmark (NHL).
- Lock and Dam Number 1 are part of the original triple-lock facilities of Wilson Dam. Opened to navigation in June 1927, this lockage system eventually became a serious bottleneck for the expanding traffic of the Tennessee River waterway. Replacement of this locking system was begun in 1956.
- Wilson Steam Plant--the largest of its kind when it was constructed in 1918--provided power to the U.S. Nitrate Plant via a BUS-BAR tunnel across the reservation. The plant consisted of power facilities, coal storage, and a skimmer wall. The plant saw limited use after the construction of Wilson Dam and was removed in 1968.
- The First Quarters site, which covers approximately seven acres on the reservation, is the site of the first housing made available to the War Department during the construction of Wilson Dam. In 1919 the site was the Administrative Quarters. After the War Department relinquished ownership, TVA used the facilities for its central offices.
- The Sewage Plant, often referred to as the Old Sewage Plant, was used to take care of the waste of the War Department housing areas and the Civilian Conservation Corps (CCC) housing. It lies in a draw in the old location of South Port and consists of a red brick building surrounded by a fence. The plant received waste from all over the reservation, as evidenced by the number of manholes seen over the area.
- The Cuba Cemetery is the reported cemetery site said to contain two mass graves associated with an influenza epidemic during the early stages of the War Department

work on the dam and nitrate plant. More work would have to be conducted to determine if this cemetery actually exists.

- The National Fertilizer Development Center (NFDC) was initially started in 1918 as the U.S. Nitrate Plant No. 2 for the production of nitrates for munitions. This facility was the cornerstone around which most of the facilities on the Muscle Shoals Reservation were built. The plant contained laboratories, cafeteria, medical facilities, and storage facilities. In 1933 TVA updated the NFDC to produce ammonium and phosphorus products for the War Department. Later the facilities were used for the production of fertilizers, hence its name. Many of today's fertilizers and production methods were derived at this plant. This Chemical Plant complex is considered eligible for listing on the National Register of Historic Places. A Memorandum of Agreement with the Alabama State Historic Preservation Office was signed in 1984. There are approximately 45 historically significant structures remaining.
- Although the dates of the Animal House are vague, it is known that this was used as a laboratory for the study of malarial mosquitoes. The term "animal house" supposedly comes from the use of test animals on the site. The structure is red brick and measures about 9.1 meters by 18.3 meters (30 feet by 60 feet).
- Wilson Dam Villages Numbers 2 and 3 (each containing approximately 100 structures) provided housing for TVA and War Department personnel during the construction of Wilson Dam. Three homes TVA retained in Village Number 3 were used as directors' homes per Section 2e of the TVA Act, and a fourth was used as a guest house. Both these villages were torn down sometime prior to 1952. All that visibly remains are roads, some curbs, and an occasional brick scatter. Also torn down were 20 detached houses located to the southeast of Wilson Dam Village Number 2. It has been reported to TVA that these structures housed African American workers. All of these sites are potentially eligible for listing on the National Register and are protected under the National Historic Preservation Act. It should also be noted that Village Number 1 still exists in Sheffield, Alabama, and is on the National Register of Historic Places.

### **3.1.5 TVA Occupation Sites**

TVA assumed control of the Muscle Shoals Reservation in 1933. TVA added many facilities along with the CCC which provided jobs to depression-stricken people. The CCC built many of the structures and improved many of the areas now used for recreation on the reservation today. These CCC facilities were used until World War II created other jobs and the program was dropped. Since then most of the structures have been removed; and only the trails, recreation areas, and a few foundations remain:

- CCC Camp Number 4499 (TVA Number 2) housed CCC workers during the 1930s. It probably contained barracks, dining, and recreational facilities. This set of

structures was torn down sometime before 1952. Today a large parking lot and a credit union sit on the former east edge of the camp. The camp extended west over the present Reservation Road.

- CCC Camp Number 2426 (TVA Number 3) was similar to CCC Camp Number 4499. The camp was torn down prior to 1952. Today this is the site of TVA's main Office Service Warehouse, Multipurpose Building, and the reservation maintenance center. One of the original buildings still remains. In 1919 this was the Clerical Quarters.
- The CCC Pavilion is a recreational facility built by the CCC in the 1930s. It consists of a covered, open-walled sandstone structure approximately 30.5 meters by 12.2 meters (100 feet by 40 feet). This location offers a spectacular view of the valley below.
- The museum site was built by the CCC in 1935. The site is situated on the bluff overlooking the river. Supposedly this site was the community center used for dances, town meetings, and other functions. The sandstone structure was torn down in 1957; but part of the foundation, which may have been the patio, remains.
- The CCC Overlook, a small structure built around 1935, is located on a point of the bluff overlooking the Tennessee River. Built of sandstone, it measures approximately 9.1 meters by 9.1 meters (30 feet by 30 feet) and has 1.2-meter (4-foot) high walls on three sides.
- Two trails were constructed by the CCC in the 1930s: the Rockpile Trail and the Small Wild Area Trail. They both exhibit stone stairs, erosion control in gullies, small foot bridges, and benches. The Rockpile Trail runs for approximately 5.6 kilometers (3.5 miles) along the river while the Small Wild Area Trail is confined to a small draw northeast of the First Quarters Site.
- The ERC Building (Rotunda), a 1950s TVA office building, is recognized by the Alabama State Historic Preservation Officer (SHPO) as being architecturally significant--especially the rotunda and auditorium.

### **3.2 Solid and Hazardous Wastes**

ERC manages a Resource Conservation Recovery Act (RCRA) permitted facility on the reservation that is regulated for handling and treatment of hazardous wastes. The ERC facility contains 202 Solid Waste Management Units (SWMUs) with 58 Units under active investigation to define the extent of hazardous contamination. Decisions on the cleanup of these facilities have not been made.

### **3.3 Visual Resources**

The overall visual character of the Muscle Shoals and Wilson Dam reservations is park-like. These reservations contain a mix of wooded and open greenspace which provide welcome respite to the citizens of Muscle Shoals, Florence, and Sheffield. The visual and recreational opportunities the reservations provide are unique to the Shoals area because of their convenience, accessibility, and park-like character.

Visual buffers shown on the Master Plan alternatives are essential to preserving the visual characteristics of the Muscle Shoals and Wilson Dam reservations.

The existing visual character of the land parcel located between Hatch Boulevard, Reservation Road, and Garage Road is that of wooded parkland and passive recreation. The area just north of the Holiday Inn has a visual character of light commercial. Reservation Road acts as the main entrance to the reservations. This entrance creates a visually pleasing sequence as one passes through park-like settings en route to recreation sites or other areas on the reservations.

### **3.4 Terrestrial Wildlife, Vegetation, and Wetlands**

TVA's Muscle Shoals and Wilson Dam Reservations consist of 1228.7 hectares (3036 acres). Five major habitat types exist as follows: 502 hectares (1240 acres) mixed woodlands; 125 hectares (310 acres) scrub-shrub; 251 hectares (620 acres) open lands; 62.7 hectares (155 acres) ponds, small creeks, and ditches; and 313.6 hectares (775 acres) developed (occupied structures, mowed lawns, paved and unpaved roads), abandoned areas, and storage yards. These habitat types are delineated by densely vegetated fence rows, abandoned railroad rights-of-way, and roads.

Woodland cover types are either planted loblolly pine or include primarily planted loblolly pine and hardwood stands consisting of various oaks, hickories, hackberry, sweetgum, elm, and black cherry. Many upland sites are also strongly invaded with *Ailanthus* (a non-native tree species). In the riparian woodlands along the Tennessee River and small water courses, the canopy consists of such species as white oak, winged elm, river birch, sycamore, hackberry, sweetgum, and hornbeam. Sites vary from pole-sized timber (trees 5 to 10 inches in diameter at breast height or DBH) to large sawtimber (with many trees in the 20 to 30 inches DBH classes and some individuals nearing 40 inches). The understories include pokeweed, honeysuckle, privet, Virginia creeper, wild grape, greenbriers, and poison ivy. Most sites lack many tree species in the understory but, rather, are very thick with privet (a non-native shrub) and lianas (climbing vines). Several areas throughout the woodlands have been invaded by kudzu, with some patches covering five or more acres.

Scrub-shrub areas along fence rows, edges of small woodlots and larger woodlands, railroad rights-of-way, and roads are abundant with persimmon, sumacs, multiflora rose, honey-locust, kudzu vine, red bud, ailanthus, blackberry, Virginia creeper, and poison ivy.

Open lands are a mix of 51 hectares (126 acres) of hay production fields (currently under an agricultural license) containing fescue, clovers, orchard grass, Johnson grass, Bermuda grass, and numerous broad-leaved weeds, and successional fields consisting of the same species found in the scrub-shrub fence rows. Species that thrive in full sunlight, such as Joe-pye-weed, iron weed, coreopsis, various asters, lespedeza, foxtail, and other native grasses also exist in these areas.

Two creeks and two ponds contain a variety of vegetation associated with hydric conditions, including willows, sycamore, sweetgum, winged elm, willow oak, hackberry, privet, blackberry, poison ivy, green dragon, pokeweed, cattail, smartweed, and jewelweed.

Developed areas contain several species of horticultural plants. Abandoned areas and storage yards have plants associated with this type of habitat. Some of these include mulleins, docks, plantains, dandelion, thistle, primrose, lambsquarter, fleabane daisy, trumpet creeper, and violets.

Some wildlife species that are known to exist on the reservations are listed below according to habitat types;

- Type A - Woodpeckers (hairy, downy, red-bellied, pileated, and flicker), yellow-breasted chat, Carolina chickadee, yellow-throated vireo, blue-gray gnatcatcher, barred owl, great horned owl, screech owl, eastern wood pewee, great-crested flycatcher, red-tailed hawk, summer tanager, ovenbird, opossum, little brown bat, big brown bat, short-tailed shrew, gray squirrel, raccoon, gray fox, coyote, red bat, hoary bat, eastern box turtle, eastern fence lizard, ground skink, five-lined skink, six-lined racerunner, broad-headed skink, rat snake, common kingsnake, ringneck snake, copperhead, timber rattlesnake, and several species of frogs, toads, and salamanders.
- Type B - Eastern towhee, northern cardinal, brown thrasher, indigo bunting, common yellowthroat, Carolina wren, yellow-billed cuckoo, worm-eating warbler, eastern chipmunk, and several species of amphibians and reptiles.
- Type C - Mourning dove, eastern meadowlark, brown-headed cowbird, northern bobwhite, blue grosbeak, red-winged blackbird, American kestrel, eastern bluebird, killdeer, American goldfinch, red fox, coyote, eastern mole, least shrew, striped skunk, some amphibians and reptiles.

- Type D - Great blue heron, green-backed heron, belted kingfisher, wood duck, chimney swift, cliff swallow, red-winged blackbird, raccoon, muskrat, mink, Eastern wood rat, water snakes, several species of frogs, toads, and salamanders.
- Type E - Robin, house finch, English sparrow, European starling, chimney swift, common nighthawk, northern mockingbird, eastern bluebird, northern bobwhite, killdeer, eastern kingbird, opossum, eastern mole, coyote, Norway rat, house mouse, long tailed weasel, raccoon, common garter snake, racer, American toad, and Woodhouse's toad.

### 3.4.1 Terrestrial Threatened and Endangered and Special Concern Species

There are at least two species listed as endangered by the USFWS that occur in the area. These species are the gray bat *Myotis grisescens* and the bald eagle *Haliaeetus leucocephalus*. Two species of plants listed as special concern on the Alabama state list also exist on the reservations. These species are Dutchman's-breeches *Dicentra cucullaria* and yellowwood *Cladrastis kentukea*.

Gray bats utilize caves as roost sites and nurseries. Key Cave, located 10.3 kilometers (6.4 air miles) from the reservations, was the site of a bat census in June 1996. A total of 37,600 adult and young gray bats were counted. Gray bats feed almost exclusively over water; therefore, it is probable that Pond Creek is utilized as a feeding corridor by gray bats.

Bald eagles are not uncommon in northern Alabama. These birds utilize shoreline/riparian and shallow water habitats for perching, loafing, and foraging. Most of this use is during the coldest winter months.

Dutchman's-breeches is a wildflower occupying rich woods mostly on well-drained slopes. It blooms in early spring with white flowers suggesting a Dutch boy's pantaloons hanging upside down on a line.

Yellowwood trees are found in moist soil around limestone cliffs, stream banks, and rich rocky coves in hardwood forests. Charles Sprague Sargent, author of the classic 14-volume *Silva of North America*, called this rare species one of the most beautiful flowering trees of the American forest.

### 3.4.2 Small Wild Area

The 9.71-hectare (24-acre) Old First Quarters Natural Area is located on the Muscle Shoals and Wilson Dam Reservations and is known locally for its spring wildflower display and winding foot trails. This area was first developed during the 1930s. Examples of stone walls, stairways, and check dams built by the CCC are still

The flora in this small wild area consists of 103 different species of trees, shrubs, and vines and 69 different species of herbaceous plants (see Appendix A).

There is one cave existing in this area; however, no threatened or endangered species are known to use it.

Two other small caves located close to Wilson Dam have a sizable population of salamanders but are absent of any threatened and endangered species.

### **3.4.3 Forest Land**

The forested sites on the Muscle Shoals Reservation host a diversity of stands and stand sites as well as a great variety of opportunities concerning how each can and/or should be treated.

Forest cover ranges from planted stands of pine (primarily loblolly); to early succession, reverting fields; to pole-sized mixed hardwoods; to large sawtimber-sized hardwood stands.

This maze of stands and their various proximity to highways, business offices, waterfront, cultural sites, and recreation areas create a variety of opportunities for timber production, wildlife enhancement, recreation, and education. Some of these areas are classified as forested wetlands and are probably the most productive sites on the reservation containing the highest value timber. Forested areas are desirable as sound barriers and for their aesthetic value. The pine stands are all over 30 years old and are characterized by overstocked conditions and open or declining crowns.

Probably of greatest significance is that most of the stands on the reservation consist of large (50.8- to 76.2-centimeter [20- to 30-inch] DBH classes and larger), old hardwoods. Hackberry, red oaks, sweetgum, hickories, elms, and black cherry comprise the majority of the species present. Some stands have a strong component of ailanthus, an exotic tree species.

Of course there are other values to be realized. Stands of large trees are fairly unique, especially those accessible to this area of fairly considerable population. Most of the stands offer the species variety aforementioned, but some offer uniqueness in the predominance of a single species or species group. For example, the area immediately east of the water intake station consists of predominately large hickories, whereas the Upper Rockpile camping site is predominately large hackberry trees.

### **3.4.4 Invasions**

A major challenge to forest management, recreation, wildlife enhancement, and aesthetics is the control of understory species (especially privet) which have invaded to the point of

making many of the stands almost impenetrable. Privet and several species of vines (including Virginia creeper, poison ivy, honeysuckle, grape and kudzu) have taken advantage of openings created by dead trees and areas where vegetation maintenance has been abandoned. Several areas throughout the woodlands have been invaded by kudzu, with some patches covering five or more acres (about 2 hectares). The presence of privet and vines precludes a diversity of tree species in the understory of most forest sites.

### **3.4.5 Wetlands**

Three forested sites are classified by Cowardin et al. (1979) as Palustrine Forested Broad-leaved Deciduous Temporarily Flooded.

Pond Creek, which essentially flows along the east boundary along Highway 133, is classified as Palustrine Emergent Persistent Seasonally Flooded.

Another unnamed creek runs through the center of the Muscle Shoals Reservation and would appear to have wetlands with the same classification as Pond Creek.

The 40.5-ha (100-acre) area bounded by Hatch Boulevard, Reservation Road, and Garage Road contains a wetland.

## **3.5 Aquatic Resources**

The Tennessee River and Pond Creek are the two aquatic habitats that could be affected by changes in land use on Wilson Dam Reservation and Muscle Shoals Reservation.

The Tennessee River from Tennessee River Mile (TRM) 256.5 to TRM 259.5 runs along the northern border of the Muscle Shoals Reservation and a small segment of the Wilson Dam Reservation. The larger portion of Wilson Dam Reservation is on the north bank of the river. This stretch of the river is part of an Alabama State Mussel Sanctuary. The mussel sanctuary extends from the base of Wilson Dam (TRM 259.5) and continues down river to the head of Seven Mile Island (TRM 253.2). Information from the USFWS and TVA's Heritage Program records indicates the possible presence of at least five federally listed species of mussels in the sanctuary. Removal of mussels from the sanctuary is prohibited by state law.

Results of a study conducted by TVA divers in 1992 revealed 17 species of mussels collected from 7 sample stations between TRM 255.0 and TRM 258.2. Species diversity at each location ranged from a high of 14 species to a low of 7 species, with an average of 10.5 species. Mussels were colonizing the gravel, sand, and cobble substrate along the left descending bank (TVA, 1992).

A total of 46 fish species were identified in TVA studies conducted from 1949 to 1977 in Pickwick Reservoir. During the 1977 cove rotenone sampling around Pickwick Reservoir, 41 species of fish were collected. The stretch of river included in this assessment is a prime sportfishing and spawning area for smallmouth bass and sauger.

Pond Creek enters the Muscle Shoals Reservation just north of the intersection of Wilson Dam Road and Highway 184 (Second Street). It meanders across the Muscle Shoals Reservation and empties into the Tennessee River at TRM 258.2. No mussel survey was conducted in the 1992 study. Information from the leader of the 1992 dive team indicated that there are very few, if any, mussels in Pond Creek (personal communication with Larry Neill). This is probably due to past practices of industries in the area discharging toxic materials into the stream.

Seine hauls were taken in the 1992 survey of Pond Creek in an effort to describe the fish community of the creek. Only four species were collected; they were green sunfish, bluegill, spotted bass, and mosquitofish, with mosquitofish being the dominant species (TVA, 1992).

### **3.6 Socioeconomics and Infrastructure**

Socioeconomic impacts would be generally within the Florence Metropolitan Statistical Area (MSA) (Colbert and Lauderdale Counties), with possible minor impacts to adjacent areas. As of 1995 estimates, the population of the MSA was about 136,000, with 52,586 persons in Colbert County and 83,598 in Lauderdale County. Total employment in the MSA in 1994 was 69,484. The largest employment sector is manufacturing, with 21.4 percent of total employment or approximately 15,000 workers. This is a larger share than either the state, at 18.4 percent, or the nation, at 13.2 percent. On the other hand, the MSA has a lower share of employment in the service sector, at 19.7 percent, compared to 23.2 in the state and 29.3 in the nation. Per capita personal income is slightly lower than the state average. In 1994 Colbert County had per capita income of \$17,525; Lauderdale County, \$17,291; and the state, \$17,922. The national average was \$21,696 in 1994.

### **3.7 Floodplains/Flood Risk**

The area potentially impacted by this plan extends from TRM 256.47 (L&N Railroad Bridge) upstream to TRM 259.4 (Wilson Dam). The 100-year floodplain for the Tennessee River varies from elevation 429.6 at TRM 256.47 to elevation 434.9 immediately downstream of Wilson Dam. The TVA Flood Risk Profile (FRP) elevation on the Tennessee River varies from elevation 431.5 at TRM 256.47 to elevation 437.2 immediately downstream of Wilson Dam. The 100-year and FRP elevations upstream of Wilson Dam are both 508.0. The FRP is used to control flood damageable development on TVA lands. For this area, these elevations are equal to the 500-year flood elevations. There is also an approximate 100-year floodplain area identified for Pond Creek.

### **3.8 Navigation**

The shoreline fronting on the Muscle Shoals and Wilson Dam Reservations extends from TRM 256.5 upstream to TRM 259.4. Navigation facilities constructed in this stretch of the Tennessee River include Wilson main and auxiliary locks located at TRM 259.4 and federal barge mooring cells (three downstream and three upstream of Wilson Locks) at TRM 259.2R and TRM 259.9R. In addition, the commercial navigation channel follows along the right bank side of the river. On the right bank side of the river, the embayment immediately upstream from Wilson Lock at TRM 259.5R contains the warehouse and dock for the navigation service boat *Sideview*, and the USACE Florence repair station. On the left bank side of the river, the embayment immediately upstream from Wilson Dam (Fleet Hollow) at TRM 259.6L is used by TVA's Heavy Equipment Department to repair boats and barges and to fleet its floating equipment along the shoreline. Fleet Hollow also contains an active commercial barge terminal at the head of the embayment.

### **3.9 Recreation**

The 1991 Alabama Statewide Comprehensive Outdoor Recreation Plan (SCORP) ranks walking trails, bike trails, parks, land, and fishing areas among the outdoor recreation needs most commonly cited by North Alabama residents. Open space and recreation facilities on the Muscle Shoals and Wilson Dam Reservations (which include walking and bike trails, two boat ramps, day use picnic area, small wild area, and a campground on the left bank and day use area/overlook on the right bank) offer a variety of outdoor recreation opportunities which can help meet the recreational needs identified in the Alabama SCORP.



## CHAPTER 4

### 4.0 Environmental Consequences

In this section, the assessment of environmental impacts of each alternative is based on typical impacts that would be associated with the type of development proposed. Site specific impacts would need to be assessed for each proposal actually considered.

### 4.1 Cultural Resources

Cultural Resources surveys have been conducted for both the Muscle Shoals and the Wilson Dam Reservations (Shaw, 1994). Historically significant archaeological and historic sites, as well as historic structures, are located on both reservations (Section 3.1). Because these cultural resources are located on federally owned land, they are protected by the National Historic Preservation Act of 1966 and the Archaeological Resources Protection Act of 1979.

#### 4.1.1 Alternative 1

Under Alternative 1, no plan would be produced. Requests for land use activities by TVA or by external organizations would be reviewed on a case-by-case basis. TVA would review all requests in consultation with the Alabama State Historic Preservation Officer (SHPO) to determine potential effects to cultural resources. Activities would be approved, mitigated, or denied according to the historical importance of the resource. If mitigation were required, appropriate measures would be completed to record the cultural resources (i.e., a phase II or III level archaeological survey or measured drawings and photographs for an historic structure).

#### 4.1.2 Alternative 2

Under this alternative, areas north and south of Reservation Road, an area along the Florence waterfront, and an area near Fleet Hollow would be reserved for recreation and open space. Visual buffers would be established along major roads and a 61-meter (200-foot) wide vegetative buffer would be established along the Pond Creek corridor.

Early in the review of external proposals, it was determined that the Sheffield proposal was located on the site of Wilson Dam Village Number 2. This site is potentially eligible for listing in the National Register of Historic Places (Shaw, 1994). Any development would require agreement between TVA and the Alabama SHPO on the appropriate mitigation measures. For example, a Phase II and possibly a Phase III archaeological survey would have to be conducted on this site. Furthermore, some type of interpretation of the cultural resources found there would also be included as part of the mitigation

efforts. Regardless of whether this site is developed as residential housing or a public recreation area, cultural resources would likely be disturbed.

The Shoals Chamber of Commerce/SEDA request near Wilson Dam would also have to be reviewed for its impacts on cultural resources. Wilson Dam, for example, is a NHL. This designation for the dam means that the Secretary of Interior has determined that Wilson Dam possesses exceptional value in commemorating or illustrating the history of the United States. Because of this designation, TVA is responsible for minimizing harm to Wilson Dam. TVA, as a federal agency, must exercise a higher standard of care when considering undertakings that may directly and adversely affect NHLs. Thus, before a building could be constructed adjacent to the dam, TVA, along with consultation from the Alabama SHPO, would have to review the impact of the new building on the historic setting of Wilson Dam.

### **4.1.3 Alternative 3**

Under this alternative, areas north and south of Reservation Road, an area near the Renaissance Tower in the northwest corner of the Wilson Dam Reservation, an area near Fleet Hollow, and additional areas along the Florence waterfront would be reserved for public recreation and open space. This use would be compatible with the cultural resources that are located there. However, any ground-disturbing activities would require review by TVA's Cultural Resources staff. Visual buffers would be established along major roads and a vegetative buffer along the Pond Creek corridor. Again, the buffers would protect the visual integrity of the cultural resources and their historic setting. Any proposals for additional or different recreational uses would be approved, denied, or mitigated according to the significance of the impact on cultural resources.

## **4.2 Visual Resources**

### **4.2.1 Alternative 1**

Adoption of the no action alternative would cause all actions to be evaluated on a case-by-case basis.

### **4.2.2 Alternatives 2 and 3**

The existing theme of passive recreation and woodland would be preserved. Development proposals would incorporate actions necessary to preserve this theme.

## **4.3 Terrestrial Wildlife, Vegetation, and Wetlands**

### **4.3.1 Alternative 1**

Adoption of the no action alternative would result in no additional effects on terrestrial wildlife at this time.

### **4.3.2 Alternatives 2 and 3**

Potential TVA uses would potentially impact wetlands identified adjacent to Second Street. Any wetlands impact would have to be mitigated. The loss of habitat along Pond Creek would affect some terrestrial wildlife and could impact a feeding corridor for the gray bat. To minimize the potential for impacts, a 30.5-meter (100-foot) wide buffer would be retained on each side of Pond Creek to protect this corridor. Forest management activities would be dictated by the level of development allowed, with more opportunities for traditional forestry with minimum development and greater potential (to an extent) for urban forestry as development increases. With the buffer along Pond Creek, this alternative would have no effect on the gray bat and insignificant impacts on other resources. There would be insignificant impacts on wildlife, vegetation, and wetlands.

## **4.4 Aquatic Resources**

### **4.4.1 Alternative 1**

Adoption of this alternative would result in no additional effects on aquatic resources at this time.

### **4.4.2 Alternative 2**

Alternative 2 may result in a small increase in rainwater runoff from impervious surfaces such as parking lots and streets. All of these additional runoff sources would eventually discharge into the Tennessee River. Any construction activities would require that Best Engineering and Best Management Practices be employed (Appendix B). Providing a 30.5-meter (100-foot) wide vegetative buffer along each side of Pond Creek would greatly reduce the possibility of pollution from surface water runoff. There would be no effect on aquatic threatened and endangered species.

### **4.4.3 Alternative 3**

Any development by TVA programs would use Best Engineering and Best Management Practices (Appendix B) to prevent introduction of soils or any other pollutants into

Pond Creek and eventually the Tennessee River. Providing a 30.5-meter (100-foot) wide vegetative buffer along each side of Pond Creek would greatly reduce the possibility of pollution from surface water runoff. There would be no effect on aquatic threatened and endangered species.

## **4.5 Socioeconomics and Infrastructure**

### **4.5.1 Alternative 1**

This alternative would result in no impacts until specific requests for additional uses of land were approved. Such requests would be reviewed on an individual basis.

### **4.5.2 Alternatives 2 and 3**

Alternatives 2 and 3 consist of recreation and open space lands with visual buffers; the potential for some organized recreation facilities; and use for government, educational, and regional development purposes. Recreation and open space may enhance the quality of life and thus provide indirect economic benefits due to increased attractiveness of the area. To the extent that the other uses (government, educational, and regional development agencies) would occur elsewhere in the area if the requests for TVA land were not met, they will have no direct economic impact. They may, however, have some indirect economic benefit if the facilities or arrangements with TVA allow cost savings or some expansion or improvement of the services they offer.

## **4.6 Floodplains/Flood Risk**

### **4.6.1 Alternative 1**

Under this alternative, TVA would continue to review requests for land use on a case-by-case basis. Any proposed project that would involve development within the limits of the 100-year floodplain of the Tennessee River or Pond Creek would be subject to the requirements of Executive Order (EO) 11988 (Floodplain Management). For alternatives not covered under TVA's class review of repetitive actions in the floodplain, EO 11988 requires the applicant to evaluate alternatives to the floodplain siting which would either identify a better option or support and document a determination of "no practicable alternative" to siting within the 100-year floodplain. If this determination can be made, adverse floodplain impacts would be minimized during design of the project.

### **4.6.2 Alternatives 2 and 3**

Under these alternatives, the Tennessee River and Pond Creek floodplains in the areas identified are relatively small and should not present a problem for development.

Furthermore, recreational use of the floodplain is considered to be acceptable provided adverse impacts are minimized. TVA would review and approve all development proposals to ensure that the impacts would be minor and the project would comply with Executive Order 11988.

## **4.7 Navigation**

### **4.7.1 Alternative 1**

TVA would review requests for land use on a case-by-case basis. Compliance with navigation guidelines under Section 26a would ensure that construction of water use facilities would not encroach on the commercial navigation channel.

### **4.7.2 Alternatives 2 and 3**

There would be no impact on navigation if the Wilson Dam Reservation were allocated to the uses proposed.

## **4.8 Recreation**

### **4.8.1 Alternative 1**

Under this alternative, requests for use of portions of the reservations would be reviewed on a case-by-case basis to determine potential impacts on open space or recreation resources. Conveyance of lands to organizations within or outside TVA for nonrecreation uses could result in adverse impacts on recreation areas on the reservations and could also limit expansion of recreation opportunities to meet future needs.

### **4.8.2 Alternative 2**

The Sheffield proposal included a recreational component in Sheffield concept B. This would be considered to have positive impacts on recreation. Otherwise, the Sheffield proposals would result in less open space land being available. The small areas proposed for nonrecreational development on Wilson Dam Reservation and adjacent to Second Street would have minimal impacts on the overall recreational character of the reservations. Areas north and south of Reservation Road, a Florence waterfront area, and an area near Fleet Hollow would be designated for recreation and open space. Vegetative buffers would be established along all major roads, and an additional 30.5-meter (100-foot) wide buffer would be established along each side of Pond Creek. These actions should amply compensate for the areas designated as nonrecreational.

### **4.8.3 Alternative 3**

Under this alternative, areas north and south of Reservation Road, a Florence waterfront area, an area near Renaissance Tower in the northwest corner of the Wilson Dam Reservation, and an area near Fleet Hollow would be designated for recreation and open space. This designation (along with the maintenance of vegetative buffers along all major roads and the Pond Creek corridor) would maintain the overall character of the Muscle Shoals and Wilson Dam Reservations as “Shoals Central Park” and maximize long-term recreation benefits from the area.

## **4.9 Air and Noise**

During construction, any open burning activity would be required to comply with applicable state and federal air pollution control requirements. Any construction noise would be short-term in nature. Facilities would be expected to comply with community noise standards. Any development plans would be reviewed to ensure that no significant air emitting or noise emitting facilities are included. No significant air quality or noise impacts would be expected from construction or operation of facilities under Alternatives 1, 2, or 3.

## CHAPTER 5

### 5.0 Conclusions

Implementation of either of the three alternatives would not result in significant impacts to cultural resources, visual resources, wildlife, wetlands, endangered or threatened species, aquatic resources, floodplains, navigation, or recreation. However, proposals under Alternatives 2 and 3 would involve more commitments to avoid adverse impacts to the maintained park-like setting of the Muscle Shoals and Wilson Dam Reservations. These measures are necessary to protect cultural and visual resources, provide buffers for solid waste management units, provide feeding corridors for gray bats, and to avoid wetlands and floodplains.



## CHAPTER 6

### 6.0 Commitments

Prior to undertaking any development, consultation would be undertaken with the Alabama SHPO to avoid or mitigate any impact to important cultural resources.

Compliance with Best Engineering and Best Management Practices would be required for all construction activities.

All development proposed outside existing developed areas would be required to fit into the reservations in a visually compatible way and to incorporate the existing them of passive recreation and park-like woodland.

A 30.5-meter (100-foot) wide buffer would be established on each side of Pond Creek to minimize aquatic impacts to gray bats.

Any wetlands and floodplains would be avoided or determinations of no practicable alternative would be made prior to any construction.



## CHAPTER 7

### 7.0 References

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## **CHAPTER 8**

### **8.0 Agencies and Persons Consulted**

Lawrence Oaks, Alabama State Historic Preservation Officer

Lee Barclay, U.S. Fish and Wildlife Service



Appendix A  
Flora of Old First Quarters Natural Area

<u>Scientific Name</u>	<u>Common Name</u>
<u>Trees, Shrubs, Vines</u>	
<i>Acer rubrum</i> L.	Red maple
<i>Acer saccharum</i> Marshal	Sugar maple
<i>Acer saccharinum</i> L.	Silver maple
<i>Acer negundo</i> L.	Box elder
<i>Aesculus pavia</i> L.	Red buckeye
<i>Aesculus glabra</i> Willd.	Ohio buckeye
<i>Ailanthus altissima</i> (Miller) Swingle	Tree of heaven
<i>Albizia julibrissin</i> Durazzini	Mimosa
<i>Alnus serrulata</i> (Ait.) Willd.	Tag alder
<i>Amelanchier arborea</i> (Michaux F.) Fernald	Serviceberry
<i>Amorpha fruticosa</i> L.	Lead-plant
<i>Ampelopsis arborea</i> (L.) Koehne	Pepper vine
<i>Anisostichus capreolata</i> (L.) Bureau	Crossvine
<i>Aralia spinosa</i> L.	Hercules club
<i>Aristolochia macrophylla</i> Lam.	Dutchman's-pipe
<i>Asimina triloba</i> (L.) Dunal	Paw-paw
<i>Berchemia scandens</i> (Hill) K. Koch	Supple-jack
<i>Betula nigra</i> L.	River birch
<i>Broussonetia papyrifera</i> (L.) Vent.	Paper mulberry
<i>Brunnichia cirrhosa</i> Banks ex Gaertner	Ladies' eardrops
<i>Calycanthus floridus</i> L.	Sweet-shrub
<i>Campsis radicans</i> (L.) Seemann	Trumpet vine
<i>Carya cordiformis</i> (Wang.) K. Koch	Bitternut-hickory
<i>Carya ovata</i> (Miller) K. Koch	Shagbark hickory
<i>Carya</i> sp.	Hickory
<i>Catalpa bignonioides</i> Walter	Indian cigar tree
<i>Celtis laevigata</i> Willd.	Hackberry
<i>Cephalanthus occidentalis</i> L.	Buttonbush
<i>Cercis canadensis</i> L.	Redbud
<i>Cladrastis lutea</i> (Michaux f.) K. Koch	Yellowwood
<i>Cocculus carolinus</i> (L.) DC	Coralbeads
<i>Cornus florida</i> L.	Flowering dogwood
<i>Corylus americana</i> Walter	Hazelnut
<i>Crataegus</i> sp.	Hawthorn
<i>Diospyros virginiana</i> L.	Persimmon
<i>Euonymus americanus</i> L.	Strawberry bush
<i>Euonymus atropurpureus</i> Jacquin	Purple-flowered wahoo
<i>Fagus grandifolia</i> Ehrhart	Beech
<i>Fraxinus americana</i> L.	American ash
<i>Fraxinus pennsylvanica</i> Marshall	Green ash
<i>Fraxinus quadrangulata</i> Michaux	Blue ash
<i>Gleditsia triacanthos</i> L.	Honey locust
<i>Gymnocladus dioica</i> (L.) K. Koch	Kentucky coffee tree
<i>Halesia carolina</i> L.	Silverbell
<i>Hamamelis virginiana</i> L.	Witchhazel
<i>Hydrangea arborescens</i> L.	Wild hydrangea
<i>Ilex opaca</i> Aiton	American holly
<i>Juglans nigra</i> L.	Black walnut

Appendix A  
Flora of Old First Quarters Natural Area

Scientific Name

Common Name

Trees, Shrubs, Vines (Continued)

<i>Juniperus virginiana</i> L.	Redcedar
<i>Ligustrum vulgare</i> L.	Common privet
<i>Lindera benzoin</i> (L.) Blume	Spicebush
<i>Liquidambar styraciflua</i> L.	Sweet gum
<i>Liriodendron tulipifera</i> L.	Tulip tree
<i>Lonicera japonica</i> Thunberg	Japanese honeysuckle
<i>Maclura pomifera</i> (Raf.) Schneider	Osage orange
<i>Magnolia</i> sp.	Deciduous magnolia
<i>Mikania scandens</i> (L.) Willd.	Climbing hempweed
<i>Morus rubra</i> L.	Red mulberry
<i>Nyssa sylvatica</i> Marshall	Black gum
<i>Ostrya virginiana</i> (Millier) K. Koch	Hop-hornbeam
<i>Paulownia tomentosa</i> (Thunberg) Steudel	Princess tree
<i>Philadelphus inodorus</i> L.	Large mock orange
<i>Phorandendron serotinum</i> (Raf.) M. C. Johnston	Mistletoe
<i>Pinus taeda</i> L.	Loblolly pine
<i>Pinus virginiana</i> Miller	Virginia pine
<i>Platanus occidentalis</i> L.	Sycamore
<i>Populus deltoides</i> Marshall	Cottonwood
<i>Prunus angustifolia</i> Marshall	Chickasaw plum
<i>Prunus caroliniana</i> Aiton	Carolina cherry laurel
<i>Prunus serotina</i> Ehrhart	Wild black cherry
<i>Quercus alba</i> L.	White oak
<i>Quercus falcata</i> Michaux	Southern red oak
<i>Quercus marilandica</i> Muenchh.	Black Jack oak
<i>Quercus nigra</i> L.	Water oak
<i>Quercus prinus</i> L.	Chestnut oak
<i>Quercus rubra</i> L.	Northern red oak
<i>Quercus stellata</i> Wang.	Post oak
<i>Quercus velutina</i> Lam.	Black oak
<i>Rhamnus caroliniana</i> Walter	Buckthorn
<i>Rhus aromatica</i> Aiton	Fragrant sumac
<i>Rhus copallina</i> L.	Winged sumac
<i>Rhus glabra</i> L.	Smooth sumac
<i>Rhus radicans</i> L.	Poison ivy
<i>Robinia pseudoacacia</i> L.	Black locust
<i>Rubus</i> spp.	Blackberry, dewberry
<i>Salix nigra</i> Marshall	Black willow
<i>Sambucus canadensis</i> L.	Elderberry
<i>Sassafras albidum</i> (Nuttall) Nees.	Sassafras
<i>Smilax bona-nox</i> L.	Green briar
<i>Smilax hispida</i> Muhl.	Tear breeches
<i>Staphylea trifolia</i> L.	Bladdernut tree
<i>Symphoricarpos orbiculatus</i> Moench.	Coral berry
<i>Tilia americana</i> L.	Linden tree
<i>Ulmus alta</i> Michaux	Winged elm

Appendix A  
Flora of Old First Quarters Natural Area

<u>Scientific Name</u>	<u>Common Name</u>
<u>Trees, Shrubs, Vines (Continued)</u>	
<i>Ulmus americana</i> L.	American elm
<i>Ulmus rubra</i> Muhl.	Slippery elm
<i>Vaccinium arboreum</i> Marshall	Farkle berry
<i>Vaccinium</i> spp.	Huckleberry
<i>Viburnum rufidulum</i> Raf.	Black haw
<i>Vinca minor</i> L.	Periwinkle
<i>Vitis rotundifolia</i> Michaux	Muscadine
<i>Vitis</i> spp.	Wild Grape
<i>Wisteria frutescens</i> (L.) Poiret.	Wild Wisteria
<u>Herbaceous Plants</u>	
<i>Achillea millefolium</i> L.	Milfoil
<i>Actaea pachypoda</i> Ell.	Doll's eyes
<i>Allium bivalve</i> (L.) Kuntz	False garlic
<i>Allium vineale</i> L.	Wild garlic
<i>Aquilegia canadensis</i> L.	Columbine
<i>Arisaema triphyllum</i> (L.) Schout	Jack-in-the-pulpit
<i>Aster</i> spp.	Aster
<i>Boehmeria cylindrica</i> (L.) Swartz.	False-nettle
<i>Campanula americana</i> L.	Blue-bell
<i>Cardamine bulbosa</i> (schreber) BSP	Bitter-cress
<i>Cardamine concatenata</i> (Michaux) Ahles.	Toothwort
<i>Cardamine diphylla</i> (Michaux) Wood	Toothwort
<i>Cardiospermum halicacabum</i> L.	Balloon vine
<i>Carex</i> spp.	Sedge
<i>Ceanothus americanus</i> L.	New Jersey tea
<i>Claytonia virginica</i> L.	Spring-beauty
<i>Conopholis americana</i> (L.) Wallroth	Squawroot
<i>Corydalis flavula</i> (Raf.) DC	Fume-wort
<i>Daucyus carota</i> L.	Queen Ann's lace
<i>Duchesnea indica</i> (Andrz.) Focke.	Indian strawberry
<i>Delphinium tricornis</i> Michaux	Wild larkspur
<i>Dicentra cucullaria</i> (L.) Bernh.	Dutchman's breeches
<i>Dichondra carolinensis</i> Michaux	Dichondea
<i>Dioscorea villosa</i> L.	Wild yam
<i>Epifagus virginiana</i> (L.) Barton	Beechdrops
<i>Erigenia bulbosa</i> (Michaux) Nuttall	Harbinger-of-spring
<i>Erigeron annuus</i> (L.) Persoon	Daisy-fleabane
<i>Erigeron canadensis</i> L.	Horse weed
<i>Erigeron philadelphicus</i> L.	Daisy-fleabane
<i>Eupatorium serotinum</i> Michaux	Late-flowering thoroughwort
<i>Eupatorium</i> spp.	Thoroughwort
<i>Euphorbia heterophylla</i> L.	Wild poinsettia
<i>Euphorbia</i> spp.	
<i>Galium</i> spp.	Bedstraw
<i>Galium</i> spp.	Bedstraw
<i>Geranium carolinianum</i> L.	Cranesbill

Appendix A  
Flora of Old First Quarters Natural Area

Scientific Name

Common Name

Herbaceous Plants (Continued)

<i>Helenium amarum</i> (Raf.) H. Rock	Bitterweed
<i>Heliotropium indicum</i> L.	Turnsole
<i>Hepatica acutiloba</i> DC	Liver-leaf
<i>Heuchera villosa</i> Michaux	Alum-root
<i>Sorghum halepense</i> (L.) Persoon	Johnson-grass
<i>Houstonia caerulea</i> L.	Yellow-eyed bluet
<i>Hybanthus concolor</i> (Forster) Sprengel	Green violet
<i>Hydrophyllum canadense</i> L.	Palmate-waterleaf
<i>Hydrophyllum macrophyllum</i> Nuttall	Pinnate-waterleaf
<i>Impatiens capensis</i> Meerb.	Touch-me-not
<i>Iris cristata</i> Aiton	Dwarf-crested-iris
<i>Isopyrum biternatum</i> (Raf.) T. & G.	False-rue-anemone
<i>Phytolacca americana</i> L.	Pokeweed
<i>Plantago aristata</i> Michaux	Plantain
<i>Plantago lanceolata</i> L.	English plantain
<i>Plantago rugelii</i> Dcne.	Plantain
<i>Pluchea</i> sp.	Stinkweed
<i>Poa annua</i> L.	Annual poa
<i>Podophyllum peltatum</i> L.	May-apple
<i>Polemonium reptans</i> L.	Jacob's ladder
<i>Polygonum aviculare</i> L.	Knotweed
<i>Polygonum persicaria</i> L.	Persicaria
<i>Polygonum pennsylvanicum</i> L.	lady's thumb
<i>Potentilla recta</i> L.	Seven-fingers
<i>Prenanthes</i> sp.	Nabulus
<i>Prunella vulgaris</i> L.	Heal-all
<i>Ptilimnium capillaceum</i> (Michaux) Raf.	Mock bishop's weed
<i>Pueraria lobata</i> (Willd.) Ohwi	Kudzu
<i>Pyrrhopappus carolinianus</i> (Walter) DC	False dandelion
<i>Ranunculus</i> spp.	Yellow buttercups
<i>RGuellia</i> sp.	Wild petunia
<i>Rumex acetosella</i> L.	Sheep sorrel
<i>Rumex crispus</i> L.	Crispy dock
<i>Rumex verticillantus</i> L.	Swamp dock
<i>Salvia lyrata</i> L.	Salvia

APPENDIX B  
Best Engineering And Best Management Practices

1. Installing cofferdams and/or silt control structures between construction areas and the stream prior to any soil/disturbing demolition/construction activity, and clarifying all water that is trapped or accumulates behind these devices to meet water quality criteria before it is returned to the stream. Cofferdams must be used where construction activity is at or below water elevation.
2. Removing demolition products and construction by-products from the site for recycling, if practicable, or proper disposal outside of a 100-year floodplain.
3. Minimizing removal of vegetation.
4. Keeping equipment out of stream (i.e., performing work “in the dry”).
5. Keeping equipment off stream banks to the degree practicable.
6. Using erosion control structures around any material stockpile areas.
7. Removing, redistributing, and stabilizing (with vegetation) all sediment which accumulates behind cofferdams and silt control structures.
8. Using vegetation (versus shot rock or riprap) wherever practicable and sustainable to stabilize streambanks and floodplains areas. These areas will be stabilized as soon as practicable using either an appropriate seed mixture that includes an annual (quick cover), 1 or 2 perennial legumes, and 1 or 2 perennial grasses (or equivalent sod). In certain periods of the year this will require initial planting of a quick cover annual only, to be followed by subsequent establishment of the perennials. Seed and soil will be protected as appropriate with erosion control netting and/or mulch and provided adequate moisture. Streambank and floodplain areas will also be permanently stabilized with native woody plants, to include trees where practicable and sustainable and consistent with other regulatory agency specifications.
9. Applying clean/shaken riprap or shot rock (where needed at water/bank interface) over a water permeable/soil impermeable fabric or geotextile to control stream sedimentation or disturbance.
10. Avoiding spilling concrete or other substances or materials into streams.
11. Designing/constructing any instream piers in a manner that discourages stream scouring or sediment deposition.
12. Bank, shoreline, and floodplain stabilization will be permanently maintained to prevent erosion, protect water quality, and reserve aquatic habitat.
13. Culverts are constructed in phases employing adequate streambank protection measures. Any diverted streamflow will be managed to prevent streambank or streambed erosion/sedimentation and allow fish passage.

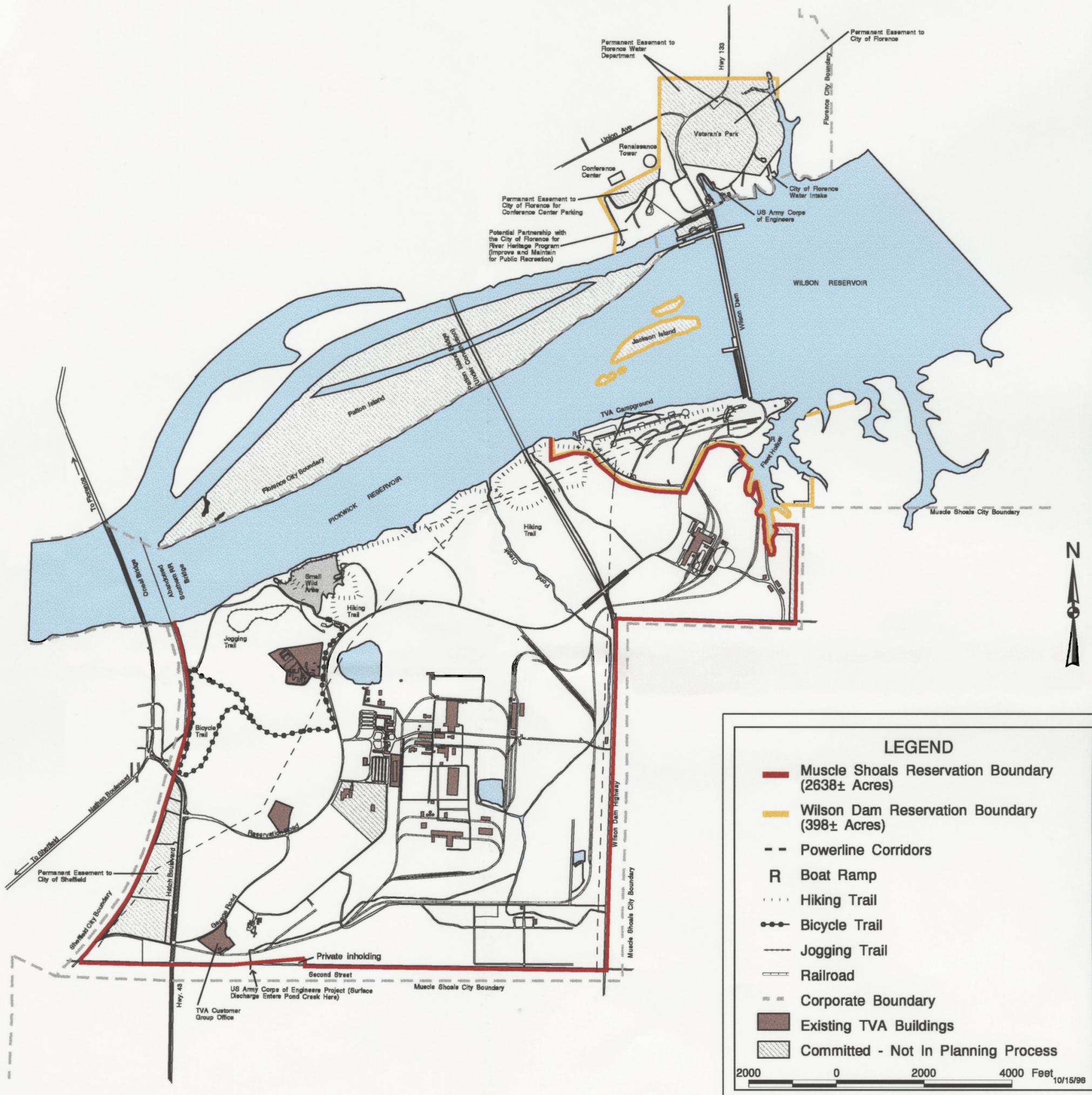
APPENDIX B  
Best Engineering And Best Management Practices

14. Culverts and any culvert extensions must allow for the creation and maintenance of natural streambed substrate (or natural substrate and pool areas throughout the culvert) and must create/maintain velocities and low patterns which offer refuge for fish and other flow conditions. Where new culverts are planned or where existing culverts are to be extended, culvert floors (bottom slabs) must be omitted, or streambed material placed on the culvert floor, or the culvert must be otherwise designed to meet the above-outlined conditions.
15. All natural stream values (including equivalent energy dissipation, elevations, and velocities; riparian vegetation; riffle/pool sequencing; habitat suitable for fish and other aquatic life) must be provided at all stream modification sites. This must be accomplished by using a combination of rock and bioengineering and not with solid, homogenous riprap from bank to bank.

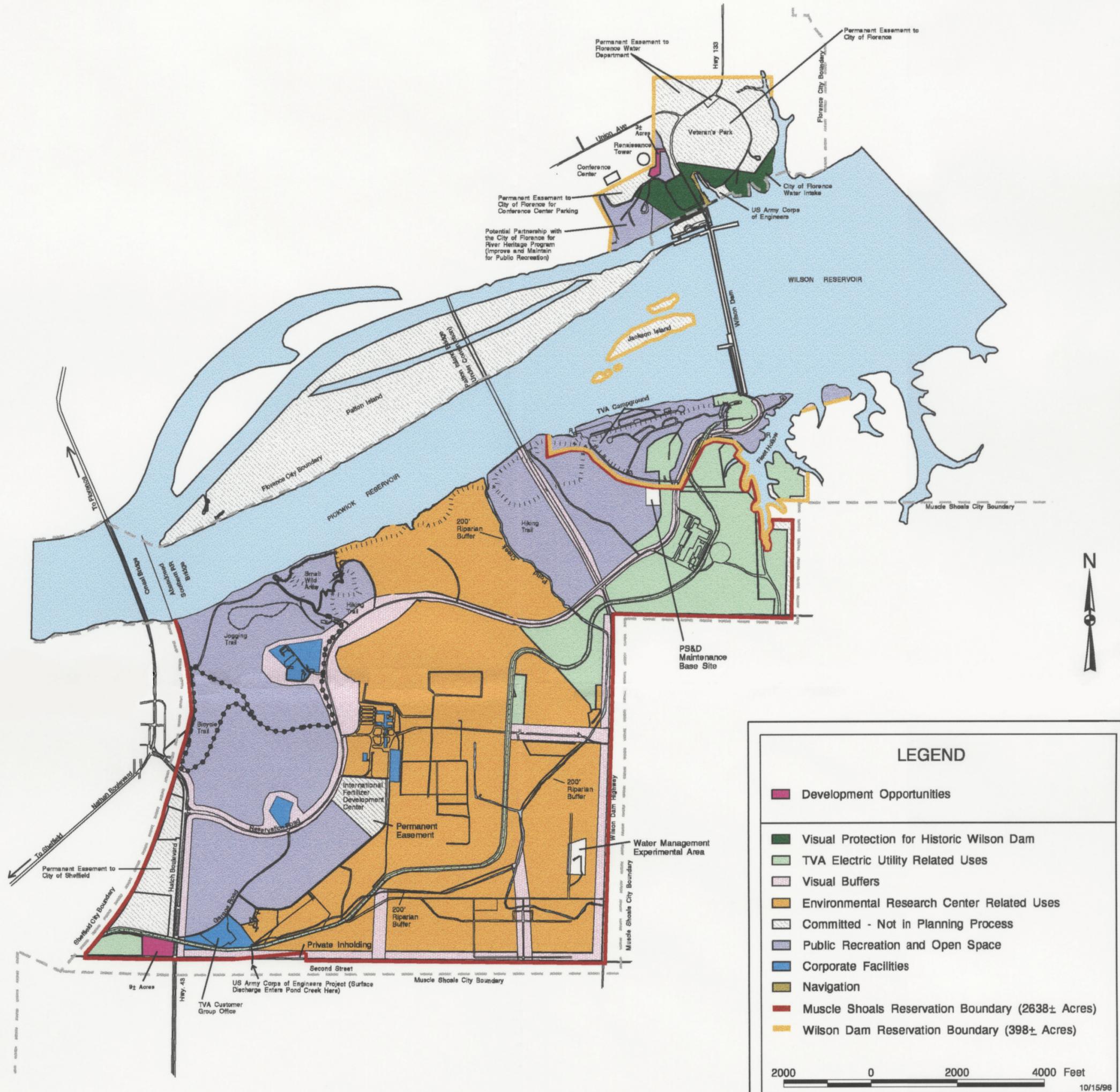
APPENDIX C  
GLOSSARY OF ACRONYMS  
(In Order of Their First Appearance in the Text)

SEDA	Shoals Economic Development Authority
UNA	University of North Alabama
EA	Environmental Assessment
USFWS	U.S. Fish and Wildlife Service
USACE	U.S. Army Corps of Engineers
ERC	Environmental Research Center
PSS	Power Service Shops
NHL	National Historic Landmark
CCC	Civilian Conservation Corps
NFDC	National Fertilizer Development Center
SHPO	State Historic Preservation Officer
DBH	Diameter at Breast Height
TRM	Tennessee River Mile
MSA	Metropolitan Statistical Area
FRP	Flood Risk Profile
SCORP	Statewide Comprehensive Outdoor Recreation Plan

# Alternative 1 No Action



# Alternative 2 TVA Program Use and Regional Development



# Alternative 3 TVA Program Use Including Public Recreation

