

**FINAL ENVIRONMENTAL ASSESSMENT**

**Mesana Investments LLC  
d/b/a Jefferson Park Subdivision  
(File Number 2008-00262)**

Proposed Community Facilities  
at  
Little Turkey Creek, Miles 1.8, Right Bank, and 2.0, Right Bank  
Opposite Tennessee River Mile 616.4, Right Bank  
Fort Loudoun Reservoir  
Knox County, Tennessee

Prepared by:  
U.S. ARMY CORPS OF ENGINEERS  
Nashville District

In cooperation with  
TENNESSEE VALLEY AUTHORITY

For further information, contact:

Deborah T. Tuck  
Regulatory Specialist  
U.S. Army Corps of Engineers  
Regulatory Branch  
3701 Bell Road  
Nashville, Tennessee 37214  
Phone: (615) 369-7518  
E-mail: [deborah.t.tuck@usace.army.mil](mailto:deborah.t.tuck@usace.army.mil)

Stanford E. Davis  
Senior NEPA Specialist  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT 11D  
Knoxville, Tennessee 37902  
Phone: (865) 632-2915  
Fax: (865) 632-3451  
E-mail: [sedavis2@tva.gov](mailto:sedavis2@tva.gov)

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Date

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## **CHAPTER 1.0 Proposed Activity**

### **1.1 Purpose and Need**

Scott Davis, Mesana Investments LLC, doing business as Jefferson Park Subdivision, submitted a complete application on 29 April 2008 to the U.S. Army Corps of Engineers (Corps) for a Department of the Army (DA) permit and to the Tennessee Valley Authority (TVA) for Section 26a approval. He requested approval to construct two fixed community docks at Miles 1.8, Right Bank, and 2.0, Right Bank, of Little Turkey Creek, a tributary to Tennessee River Mile 616.4, Right Bank, Fort Loudoun Reservoir, Knox County, Tennessee (Figure 1). These community docks would be constructed for use by back-lying residents of a partially developed subdivision. Approval of these community docks would meet the needs of the applicant, allow convenient reservoir access for subdivision residents, enhance market value of the development properties, and likely result in economic benefits to the developer and community.

See Section 1.3 Decision Required below for a discussion of DA and TVA permitting authorities. See Appendix A for Joint Public Notice (JPN) 08-11 dated 12 May 2008 with location map and plans for the community docks. The comment period on the JPN ended on 11 June 2008.

### **1.2 Background**

The site is located on Little Turkey Creek, a tributary of the Tennessee River, Fort Loudoun Reservoir. The Jefferson Park Subdivision is located along Northshore Drive in Knox County, Tennessee, near the town of Farragut, just outside Knoxville (see Figure 1). The applicant owns approximately 158.4 acres of land, of which approximately 127 acres, located above the normal summer pool elevation 813 mean sea level (msl) of Fort Loudoun Reservoir, are proposed for residential development. No action that requires DA or TVA approval is being proposed on the subdivision uplands above elevation 820 msl or on the applicant's remaining 31.4 acres of land. These areas are outside the scope of this environmental assessment (EA). The normal winter pool of Fort Loudoun Reservoir is elevation 807 msl.

The proposed community docks, noted as Community Dock A (located on Common Lot #1) and Community Dock B (located on Common Lot #2), would be constructed at two separate locations with common lot access for all residents along 642 feet and 692 feet of shoreline, respectively, (1,334 feet total). Both docks would also have an attached nonpotable water intake for upland irrigation use between May and October. In addition, the applicant proposes to install riprap along the shoreline at Common Lot #1 (642 linear feet) and Common Lot #2 (692 linear feet) to prevent erosion. The Corps conducted a Minimal Effects Determination of the proposed riprap installation and determined that this activity would meet the DA Nationwide Permit (NWP) #13 Bank Stabilization, which became effective 19 March 2007. The applicant also proposes to construct a boat launching ramp at Community Dock A. The proposed boat launching ramp would meet the criteria of DA NWP #36 Boat Ramps, which became effective 19 March 2007. These NWPs are valid for a period of two years from date of issuance. See Appendix B for the proposed plans associated with the NWPs and their corresponding special conditions. The facilities would be amenities to the new 299-lot Jefferson Park Subdivision, and the community docks would help to accommodate water access needs of interior lot owners. The applicant also proposes to provide 35 waterfront lots with individual reservoir access and the opportunity to construct boat moorage facilities. The applicant owns a total of 4,890 linear feet of shoreline on Little Turkey Creek. Of this total, 3,556 feet of shoreline would be utilized by the 35 individual lot owners who may construct private docks and related appurtenances (see the subsection below entitled other ancillary facilities already approved).



Figure 1. General Jefferson Park Subdivision Site Map

The applicant has already constructed four storm water culverts on the upland portions of the development, three of which are constructed below elevation 820 msl on land within the limits of TVA's flowage easement (see land use classification in Section 3.4 for a brief discussion of flowage easement rights acquired). Section 26a approval by TVA would be required for three of these culverts within TVA flowage easement and a land-based open-air gazebo proposed to be located near Community Dock B (see Section 1.3 Decision Required). Since installation of these culverts and other improvements above elevation 813 msl does not involve discharge of dredged or fill material into the waterway or obstruct navigation below the ordinary high-water mark, the Corps is not required to issue a DA permit for these structures.

An on-site inspection was conducted by the Corps on 21 March 2008. See Appendix D for the Corps' on-site photos. TVA staff visited the site by land for its initial meeting with the applicant on 24 May 2007, informally on 19 November 2007 once interior road construction had begun, and again on 5 February 2008 following receipt of the shoreline improvement projects application. Furthermore, during the conduct of annual shoreline inspections, TVA staff viewed the site on 13 July 2007 and 7 August 2008.

### **Other Ancillary Facilities Already Approved**

As indicated above, the applicant has also requested and received TVA and DA approvals for individual private (i.e., noncommunity) water use facilities associated with each of 35 lakefront lots. These individual facilities each include a fixed covered boat slip as well as a boatlift, riprap shoreline stabilization, a nonpotable water intake, and underground water and electric utility lines. These lakefront lots occupy the remaining 3,556 feet of the applicant's shoreline both upstream and downstream of the common access lots and proposed community structures (see Figure 1). These facilities and associated shoreline alterations met TVA's criteria for being categorically excluded under the *National Environmental Policy Act* (NEPA) and TVA approved them on 30 June 2008.

The proposed individual dock facilities and associated activities meet the criteria of DA Regional Permit (RP) 08-RP-01, Dock Structures and Associated Activities on Tennessee Valley Authority (TVA) Lakes, which became effective 14 April 2008 and expires on 14 April 2013. The Corps issued DA permits pursuant to RP 08-RP-01 to the applicant in July-August 2008 for the construction of private boat docks and associated activities on the 35 waterfront lots within the new development. This would allow each lakefront lot owner the opportunity to construct private dock facilities and perform associated activities under general and special conditions contingent upon other state, federal, and/or local approvals for the same activities. See Appendix C for the 08-RP-01 conditions. In accordance with DA regulations, any bank stabilization (riprap) activities associated with the waterfront lots would also be required to meet the criteria of NWP #13 Bank Stabilization (see Appendix B).

### **1.3 Decision Required**

Section 10 of the *Rivers and Harbors Act of 1899* prohibits the alteration or obstruction of any navigable waters of the United States unless authorized by the Secretary of the Army acting through the Chief of Engineers. The Corps is required to approve the proposed community facilities, 35 private docks, launch ramp, stabilization, intakes, and other shoreline alterations that impact areas below elevation 813 msl. Section 26a of the *TVA Act* requires that no dam, appurtenant work, or other obstruction affecting navigation, flood control, or public lands or reservations be constructed and thereafter operated or maintained across, along, or in the Tennessee River or any of its tributaries until plans for such construction, operation, and

maintenance have been submitted to and approved by TVA. Little Turkey Creek is a navigable water of the United States as defined by 33 Code of Federal Regulations (CFR) Part 329. Since the proposal involves structures on a navigable waterway and a tributary to the Tennessee River, Section 10 and Section 26a approvals would be required. Therefore, the Corps and TVA must decide whether to (A) issue a permit, (B) issue a permit with modifications and/or conditions, or (C) deny the permit.

Approval by TVA under Section 26a of the *TVA Act* is required for the community facilities and associated activities. TVA's Section 26a regulations provide that several factors should be considered in determining the appropriate size and number of slips at community water use facilities (see 18 CFR § 1304.206(b)(2)). One of these factors is the length of shoreline frontage associated with the community lot, and this factor is pertinent, at least in part, because the shoreline frontage that is set aside for the community lot will support only community water use facilities and will not be available to support individual private water use facilities. In accordance with 18 CFR § 1304.206(b)(2) and current policy and given the length of shoreline frontage associated with the common lots, TVA has determined that the footprints of the proposed Jefferson Park community docks are of an appropriate size. This determination is consistent with other recent determinations of appropriate size of community facilities on Fort Loudoun Reservoir and across the Tennessee Valley.

The applicant is also required to obtain TVA approval of three culverts below elevations 820 msl that have already been constructed, as well as the proposed land-based open-air gazebo (see Section 1.2 Background above). An evaluation of the environmental effects of the community facilities, 35 private docks, launch ramp, stabilization, intakes, and other alterations as well as construction of the three culverts below elevation 820 msl is included in this EA. All of these structures and activities are within the scope of the analysis as described in Section 1.4.

#### **1.4 Scope of the Analysis**

The geographic scope of analysis for the DA permit application is generally limited to the shoreline, where the structures would be placed, and near-shoreline, i.e., the immediate upland areas directly affected by construction of the community facilities. TVA's jurisdiction at this location extends to the limits of its flowage easement, elevation 820 msl, or the 500-year floodplain, whichever is higher on the landscape.

For purposes of this evaluation, the Corps considers the proposed community facilities would occur within the geographic scope of this review. The direct, indirect, and/or secondary and cumulative impacts of the community facilities would be evaluated. Although the associated upland development is relational, construction of the development is not dependent upon construction of the community facilities. Therefore, those impacts are not typically within the scope of this review for DA permitting. However, in this case, the upland residential development and the proposed community facilities pose a visual impact to a historic property eligible for listing on the National Register of Historic Places (NRHP). Therefore, the Corps would evaluate the potential impacts that may result from the upland residential property as it relates to this resource. This is discussed in more detail in Section 3.4.

For purposes of evaluation and permitting by TVA, the landward depth of the shoreline lots where individual docks and other shoreline alterations would occur is considered within the geographic scope of this review to the above limits, as defined. Therefore, impacts that would occur within TVA's scope of review would be evaluated. The direct, indirect, and/or secondary

and cumulative impacts of the community facilities and the upland development (to the limits identified) would be evaluated. The cumulative effects of both the approved individual facilities and the two proposed community facilities are discussed in Section 3.5.

TVA is a cooperating agency in the preparation of this EA, which addresses the anticipated impacts of the proposed water-dependent facilities upon both the aquatic and terrestrial environments as indicated above.

### **1.5 Other Approvals Required**

In addition to approvals required from the Corps and TVA, other federal, state, and/or local approvals may be needed for this work. Tennessee Department of Environment and Conservation (TDEC) issued a Notice of Coverage under the General National Pollutant Discharge Elimination System (NPDES) Permit, TNR132647, for Storm Water Discharges Associated with Construction Activity effective 13 July 2007, expiring 30 May 2010. TDEC would also require water quality certification for both the ramp and bank stabilization construction activities. The state has previously issued general permits for both of these activities. See Appendix B for the state-issued general permits.

### **1.6. The Applicant's Proposed Activity**

The work would involve the construction of two fixed community docks at common lots along 1,334 linear feet of shoreline available for water access and boat moorage for back-lying property owners. Each dock would also have an attached nonpotable water intake for upland irrigation. Irrigation would be conducted for three hours daily from May to October. Each intake line would extend 30 feet from the shoreline. The community facilities and appurtenances within both common lots would be accessible by all residents.

Community Dock A would be covered and would measure 58 feet wide by 103 feet long, with eight double-berth slips capable of mooring 16 boats. The walkway would be 50 feet long, and therefore, the entire structure would extend 118 feet lakeward from normal summer pool elevation 813 msl. A 14-foot-wide and 50-foot-long concrete launching ramp, which would extend about 25 feet lakeward from normal summer pool, would be constructed adjacent to the dock, and riprap stabilization would be placed along 642 feet of the community lot's shoreline. A nonpotable water intake (1.25-inch line) and 1.5-horsepower intake pump, with a maximum capacity of 30 gallons per minute, would be attached to the community dock and would be used to irrigate the lawn of Common Lot #1.

Community Dock B would be uncovered and would measure 22 feet wide by 692 feet long, providing 11 double-berth slips capable of mooring 22 boats. The slips would all be connected by an 8-foot-wide fixed boardwalk and follow the natural shoreline curvature for 692 feet along the shoreline. Riprap stabilization would also be placed along the length of this shoreline. There would be a 10-foot-wide by 20-foot-long fishing pier/courtesy dock located at the end. A similar nonpotable water intake would be attached to this community dock and would be used to irrigate the lawn of Common Lot #2. Refer to Appendices A-C for details of the community docks and associated activities.

## **CHAPTER 2.0 Alternatives Analysis**

### **2.1 Introduction**

In this section, criteria to be considered and the alternatives required for permit evaluation, pursuant to 33 CFR § 320.4(a)(2) General Policies for Evaluating Permit Applications, Public Interest Review, and Part 325 Appendix B Procedural Provisions for Implementing NEPA for Regulatory Actions, are discussed. The relevant environmental issues identified in Chapter 3.0 and comments received from the public interest review identified in Chapter 4.0 formulate the basis of evaluating the applicant's proposal. Consideration is also given to other state, local, and/or federal agency recommendations and determinations.

### **2.2 Description of the Alternatives**

The alternatives that were given detailed consideration are (A) No Action, (B) the Applicant's Proposed Action and (C) the Proposed Action With Special Conditions.

A. No Action. This alternative would result from permit denial or the applicant's withdrawal of the permit application, or election to offer only non-water-dependent amenities that would not require a DA or TVA approval. The applicant is also developing his private land above elevation 820 msl, the limits of TVA flowage easement, which does not require DA or TVA approval.

B. The Applicant's Proposed Action. The proposed work is to provide convenient reservoir access and private boat moorage for residents of Jefferson Park Subdivision. According to the applicant, efforts were made during the planning and design phases of the project to minimize unavoidable impacts to the waters of the U.S. to the extent practicable. The applicant's plan also includes the individual private water use facilities previously approved by TVA and authorized by DA NWP and/or RP that would have minor anticipated impacts. In accordance with DA regulations, there are no discharges of fill material other than the discharges associated with the NWP activities. No public land is involved. The applicant has already implemented erosion control for the entire project development.

C. The Proposed Action With Special Conditions. Under this alternative, approval of the applicant's proposal with the addition of special conditions to minimize anticipated water quality and historic properties impacts would be required. Measures to maintain structural integrity, shoreline stability, and navigational safety would also be included. Under this alternative, the federal actions and scope and nature of the proposed development is the same as Alternative B. The recommended special conditions are listed in Section 5.2.

### **2.3 Comparison of Alternatives**

A. No Action. With this alternative, the applicant would not impact the reservoir resources. However, adoption of this alternative would not meet the immediate needs of the applicant to provide recreational boating access to back-lying property owners, thereby fully recognizing the economic benefits from his investment. Except for those lots directly fronting the reservoir, very few of the other 299 private lot owners would be afforded direct reservoir access and private boat moorage.

B. The Applicant's Proposed Action. Under this alternative, the applicant would perform the proposed work, similar to existing community facilities and other shoreline improvements in nearby lakefront subdivisions. At this time, TVA and the Corps acknowledge that only one private common

dock in the embayment serves interior lots. All other community facilities are day use facilities. TVA assumes the already approved individual shoreline docks, stabilization, and associated improvements would be constructed by the new lot owners as the waterfront lots are sold and transferred by the applicant. The proposed work is the only practicable alternative to the applicant in order to provide convenient water access and moorage of private boats for back-lying homeowners within the subdivision. According to the applicant, his proposal would be convenient for homeowners and would allow access to the reservoir for launching, fishing, and boat moorage, as well as general community uses, rather than competing with the general population for these amenities. Rather than offer only the waterfront homeowners' exclusive use of reservoir amenities, the applicant wants to offer interior lot owners the same opportunity to enjoy convenient recreational opportunities. The applicant has designed the project to minimize and/or avoid, to the extent practicable, erosion and sedimentation impacts upon remaining water resources. The improvements would meet the needs of the applicant, allow convenient reservoir access for residents, enhance market value, and likely result in economic benefits to the developer and the community. There would be minor adverse site-specific and cumulative impacts overall.

C. The Proposed Action With Special Conditions. The potential impact of adopting this proposal would be similar to Alternative B above. However, the addition of special conditions would reduce adverse impacts to the environment. Provided the applicant adheres to the special conditions in Section 5.2, this would be the most environmentally acceptable alternative.

## **CHAPTER 3.0 Environmental and Public Interest Factors Considered**

### **3.1 Introduction.**

In accordance with 33 CFR 320.4(a)(1) General Policies for Evaluating Permit Applications, Public Interest Review, the Corps decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. The benefits that reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. JPN 08-11 (Appendix A) listed factors that may be relevant to the proposal and must be considered. The factors indicated by an (x) are those that are relevant to the proposal.

### **3.2 Physical/Chemical Characteristics and Anticipated Changes**

(x) **Substrate.** The reservoir bottom substrate of the cove generally consists of clay, sediments, and exposed rocky points. Because of the extent of similar rocky soil substrate in Little Turkey Creek embayment and Fort Loudoun Reservoir, construction of these dock support structures at this location would only occupy a small fraction of the total available substrate of this type. Therefore, such use would have a negligible impact upon the availability of such substrate or the aquatic life it supports.

( ) **Suspended particulates, turbidity.** See Water quality section below.

(X) **Water quality.** The free-flowing reach of Little Turkey Creek upstream of the embayment is classified by TDEC for fish and aquatic life, recreation, irrigation, and livestock watering and wildlife. Designated uses in this section of the Fort Loudoun Reservoir include domestic and industrial water supply, fish and aquatic life, recreation, irrigation, livestock watering and wildlife, and navigation. Little Turkey Creek is on the state 303(d) list as impaired waters (not fully supporting its designated uses) due to loss of biological integrity due to siltation

and *Escherichia coli* (also known as *E. coli*) from discharges from a municipal separate storm sewer system (MS4) area. TVA Vital Signs monitoring rated Fort Loudoun Reservoir as poor in 2007 (<http://www.tva.gov/environment/ecohealth/fortloudoun.htm>). Conditions were similar to most previous years. Low ratings for two indicators, chlorophyll and bottom life, consistently reduce the reservoir's overall health score. In addition, dissolved oxygen concentrations rate lower during drought years with low flows such as 2007. One indicator, sediment quality, improved in 2007.

Soil disturbances associated with construction activities can potentially result in adverse surface water impacts. Soil erosion and sedimentation can cover habitat for benthic organisms and increase turbidity. Removal of the tree canopy and vegetation along the shoreline can increase erosion, water temperatures, algal growth, and dissolved oxygen depletion. In addition to construction activities, boat waves and exhaust, petroleum spills and improper marina operations, wastewater disposal, and control of surface runoff and potential pollutants can adversely impact water quality and aquatic life. Pollutants can kill aquatic life, and nutrient runoff from residential areas can increase primary productivity (algae growth). Although infrequent on Fort Loudoun Reservoir, as algae populations die, their decomposition in deep waters of the reservoir could reduce oxygen concentrations during the summer months. Similarly, improper use of herbicides to control vegetation can result in runoff to the reservoir and subsequent aquatic impacts.

The proposed project site was previously heavily wooded with mature trees and shrubs, supporting a fairly stable shoreline. Upland clearing and development practices begun during the winter of 2007-2008 have resulted in the removal of native vegetation within most of the development. Specifically, removal of the vegetation along the shoreline of Common Lot #1, Common Lot #2, and much of the adjacent landscape has subjected the shoreline to increased wave wash and erosion. However, the applicant has placed a silt fence along the entire shoreline for erosion control during construction activities. The applicant also covered the denuded areas near and along the shoreline with mulch, from chipping of the on-site vegetation, in an attempt to reduce potential erosion and sedimentation impacts. Although silt fences border the shoreline, they do nothing to reduce impacts directly to the shoreline water quality below them, including the effects of wave wash. Particularly during the early summer of 2008, this activity contributed to a slight reduction in normal water quality and clarity, with some sediment deposition. During the summer of 2008, some natural revegetation occurred on the site to help curb minor erosion and sedimentation (also see Shoreline erosion and accretion patterns below). Reseeding, mulching, and/or planting vegetation would minimize these impacts (see Section 5.2). The Corps has no jurisdictional regulatory authority to dictate land practices to upland and shoreline vegetation on private land. Removal, modification, or establishment of vegetation on privately owned shoreland subject to TVA flowage easements does not require approval by TVA (see Noise and Land use classification below).

The applicant would be required to comply with a storm water pollution prevention plan (SWPPP) approved by TDEC. There would be no fueling capabilities at either of the community docks. With proper implementation of best management practices (BMPs) to control pollutants and compliance with applicable environmental laws and regulations, normal construction and usage would most likely have only a minor impact from fuel spills associated with recreational boating, storm water runoff, and associated pollution generated from the proposed shoreline development. There are ephemeral and intermittent streams above the project site that form the embayment of Little Turkey Creek. At the project location, Little Turkey Creek has a

perennial flow that averages 700 feet in width. Little Turkey Creek (proper), which is a medium-sized stream with perennial flow, enters the embayment on the opposite shore and just downstream of the subdivision. Turkey Creek, which enters from the east on the opposite end of the embayment, also provides perennial flow to Fort Loudoun Reservoir and the Tennessee River. These constant and irregular stream flows, combined with the flow from the release of water from Fort Loudoun Dam in the Tennessee River, maintain sufficient flow preventing stagnation in the embayment and river. Collectively, they diffuse turbidity and flush pollutants, minimizing these effects and the anticipated contribution from Jefferson Park. Because of vegetation growth, site stability, and shoreline armoring (stabilization), over the long term, TVA and the Corps do not believe that the contribution of sediments or other pollutants from construction and use of the proposed shoreline facilities would significantly worsen current water quality in the Little Turkey Creek embayment. Overall, the work would result in a minor temporary site-specific adverse impact upon water quality.

( ) **Baseflow, currents, circulation or drainage patterns.**

(X) **Flood control functions.** Consistent with Executive Order 11988 (Floodplain Management), the proposed facilities and shoreline alterations are considered repetitive actions in the floodplain that would result in minor impacts. The proposed project would comply with the TVA Flood Control Storage Loss Guideline because there would be less than 1 acre-foot of displaced flood control storage from the proposed shoreline stabilization.

To ensure that the proposed development would not adversely impact floodplains and flood control, the following conditions would be included in the final federal permits.

1. The 100-year flood elevation at this site is estimated to be elevation 816.5 msl. At a minimum, all the covered fixed docks would be designed to prevent damage to moored or stored boats by forcing them against the roof during a 100-year flood event.
2. The floor elevation of the fixed docks would be a minimum of 2 feet above the normal summer pool elevation 813 msl.
3. For purposes of shoreline bank stabilization, all riprap would be placed, on average, no more than 2 feet from the existing shoreline at normal summer pool elevation 813 msl.
4. For all electrical services permitted, a disconnect switch would be located at or above elevation 818.3 msl so that it is accessible during flooding.

(x) **Storm, wave, and erosion buffers.** Boating activities generally result in additional wave wash and erosion to the shoreline. This is a normal occurrence on rivers, reservoirs, and lakes with commercial and/or recreational boat traffic. Areas that are highly developed are particularly subject to increased erosion potential. Therefore, buffers are important and critical in reducing impacts from developments and associated general human consumptive uses. Little Turkey Creek is heavily utilized by the recreating public, particularly on summer weekends and holidays, in the form of residential private/community docks, public marinas and parks, boat launching ramps, and fishing piers. Although the applicant initially removed the natural vegetation over much of the site, he proposes to place riprap along the entire shoreline fronting his property, including 1,334 feet of shoreline in the common lot areas, to aid in erosion control. There are no plans for a wave break at this time. Implementation of the proposal would be a minor site-specific adverse impact upon the lake environment.

**(x) Shore erosion and accretion patterns.** As indicated above, the private shoreline was initially denuded in most areas due to development of the subdivision. Development of undisturbed land causes removal of the root systems that are valuable in stabilizing the soil environments. During rainfall events, live roots and vegetative ground cover filters sediments and uptakes nutrients, which generally prevent erosion and protect water resources. Removal of vegetation and construction along the shoreline and upland areas would have a minor adverse impact upon the shoreline resources. However, the applicant reduced potential erosion and sedimentation impacts by covering the denuded areas, near and along the shoreline, with mulch from the on-site vegetation removal process. A full summer of vegetation growth has helped to stabilize the site. Implementation of proper erosion-control measures throughout the life of the project would minimize adverse impacts upon the shoreline resources (see Section 5.2). In accordance with an approved SWPPP, a reseeding and/or planting plan implemented throughout the project site would further reduce erosion and accretion potential to both upland shoreline resources. The proposal would be a minor site-specific adverse impact upon the aquatic/terrestrial lake environment.

### **3.3 Biological Characteristics and Anticipated Changes**

**(x) Special aquatic sites** (wetlands, mudflats, pool and riffle areas, vegetated shallows, sanctuaries, and refuges, as defined in 40 CFR 230.40-45). No wetlands occur on the shorelands that would be affected by the proposed shoreline docks and associated improvements. Impounded water in Fort Loudoun Reservoir is drawn down in the fall for wintertime flood control purposes to approximately elevation 807 msl, so seasonal nonvegetated mud flats are exposed. These areas, typically in fall and early winter, provide some foraging habitat for some shore and water birds. Construction and use of the proposed docks and other facilities would displace some use of this shoreline habitat by these birds in the future. Because of the amount of surrounding residential development and since this shoreline is such a small fraction of the available shoreline habitat on the reservoir, impacts on these birds would be minor and insignificant.

**(x) Habitat for fish and other aquatic organisms.** Initially, any sedimentation resulting from removal of the shoreline vegetation would likely adversely impact aquatic habitat. Removal of riparian vegetation increases water temperatures by eliminating natural shade and cover. See water quality section above for a discussion of other activities that could have secondary effects on aquatic life. The natural succession of falling, rotting trees and limbs, detritus, and leaf litter provide habitat and food sources for aquatic life, a vital link in the lower food chain. When natural habitat sources are disturbed, these processes are reduced or halted, which is an adverse impact upon the aquatic habitat. However, the boat docks and riprap would provide shading, structure, and new forms of aquatic habitat to be utilized as shelter for fish and benthic macroinvertebrates as well as food sources for fish and other aquatic organisms. Therefore, the proposed shoreline improvements would be a minor site-specific adverse impact upon the lake environment, with some site-specific benefits.

**(x) Wildlife habitat and plant community.** The applicant proposes to develop 127 acres of private property for a residential community. Prior to current development, the land was heavily wooded, dominated by eastern red cedar with a mixture of hardwoods and pine. The property is likely occupied by deer, turkey and small game, reptiles, amphibians, and birds. Removal of existing vegetation has caused disruption and permanent relocation of some native flora and fauna from much of the area. The applicant has designated 12 acres of green space

throughout the development, which would likely help to minimize these impacts. Only limited numbers of small game and nongame resident and migrant wildlife would likely occupy or frequent the area in the future. Due to the change in vegetative habitats for construction of the subdivision and proposed facilities, wildlife have altered their feeding, nesting, and movement patterns in order to avoid this area and relocate to more suitable locations within the project vicinity. These small displaced wildlife populations would compete with others of their species for available suitable habitat and eventually reach equilibrium in their new environment. Therefore, the proposal would have a minor site-specific adverse impact upon these communities.

**(x) Endangered or threatened species.** Initial informal consultation with the U.S. Fish and Wildlife Service (USFWS) was conducted through the public notice process. By letter dated 6 June 2008, the USFWS indicated that based upon available data collection records, no federally listed or proposed endangered or threatened species are known to occur within the project area. USFWS anticipates only minimal net impacts to fish and wildlife or their habitats. Based on the TVA Natural Heritage database and knowledge of the area, there are no records of caves or federally listed terrestrial threatened or endangered animals in the impact area of this proposal. Eleven listed aquatic animal species are reported to occur within a 10-mile radius of the Jefferson Park Subdivision site, but none would be affected by the proposed shoreline improvements. Table 1 provides a list of fish, mussel, and snail species and their current state and/or federal status.

Within this 10-mile radius, the federally listed as endangered fanshell, orange-foot pimpleback, and ring pink mussel are reported to occur in the Clinch River drainage. No impacts to those species are expected. The snail darter, federally listed as threatened, does not occur within the affected watershed, and therefore, would not be impacted by implementation of the proposed actions. Based on these reviews, TVA and the Corps have determined that no federally listed animal or plant species would be affected by the proposed actions. By letter dated 2 April 2009, USFWS states that available records do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project and that requirements under Section 7 of the *Endangered Species Act of 1973*, as amended, are fulfilled (see Appendix G).

The flamed chub, state-listed in need of management, occurs in the affected watershed; however, it would not be impacted because neither suitable habitat nor this fish occur in the impact area of this proposal. No other state-listed fish or other terrestrial or aquatic animals occur on the Jefferson Park Subdivision shoreland or in Little Turkey Creek in the vicinity of the proposed shoreline development.

There are two state-listed plant species reported in wet areas in the Little Turkey Creek drainage within 5 miles of the proposed Jefferson Park Subdivision. Sweetscent ladies tresses (*Spiranthes odorata*), listed as endangered in Tennessee, typically occurs in seasonally inundated sites and may flower while emerging from shallow water. Marsh pea (*Lathyrus palustris*), listed as of special concern in Tennessee, occurs in wetland communities. Both of these species are more common in other parts of their range in other states. However, no suitable habitat for these plants is known to occur within the impact areas of these shoreline improvements, and no impact on any state-listed plant species is expected.

**Table 1. Federally and State-Listed as Threatened and Endangered Aquatic Animals Reported From Within 10 Miles of the Jefferson Park Site, Little Turkey Creek, Fort Loudoun Reservoir, Opposite Tennessee River Mile 616.4, Right Bank**

Common Name	Scientific Name	State Status and Ranks <sup>1</sup>	Federal Status <sup>1</sup>
<b>Fish</b>			
Blotchside logperch	<i>Percina burtoni</i>	NMGT (S2)	-
Blue sucker	<i>Cycleptus elongatus</i>	THR (S2)	-
Flame chub	<i>Hemitremia flammea</i>	NMGT (S3)	-
Highfin carpsucker	<i>Carpionodes verlifer</i>	NMGT (S2S3)	-
Snail darter	<i>Percina tanasi</i>	THR (S2S3)	THR
Tangerine darter	<i>Percina aurantiaca</i>	NMGT (S3)	-
<b>Mussels</b>			
Fanshell	<i>Cyprogenia stegaria</i>	END (S1)	END
Orange-foot pimpleback	<i>Plethobasus cooperianus</i>	END (S1)	END
Ring pink	<i>Obovaria retusa</i>	END (S1)	END
Sheepnose	<i>Plethobasus cyphus</i>	TRKD (S2S3)	CAND
<b>Snail</b>			
Spiny riversnail	<i>Io fluviialis</i>	TRKD (S2S3)	-

- = Not applicable

<sup>1</sup>**Status codes:** CAND = Federal candidate species; END = Endangered; NMGT = In need of management; THR = Threatened; TRKD = Tracked by state Natural Heritage Program

**State ranks:** S1 = Critically imperiled with less than five occurrences; S2 = Imperiled with six to 20 occurrences; S3 = Vulnerable with 21 to 100 occurrences; S#S# = Occurrence numbers are uncertain

( ) **Biological availability of possible contaminants in dredged or fill material.**

**3.4 Human Use Characteristics and Anticipated Impacts**

(x) **Existing and potential water supplies; water conservation.** There are no existing or potential water supplies in Little Turkey Creek or the project vicinity.

(x) **Water-related recreation.** Little Turkey Creek is heavily utilized by the recreating public for activities such as boating, fishing, swimming, and picnicking. Specifically, this area is densely populated by residential neighborhoods, which have existing private and community-based water use facilities such as boat docks, launching ramps, and fishing piers. Concord Park and Concord Marina are located within 5 miles of Jefferson Park Subdivision and offer boat launching, moorage, reservoir access, swimming, picnicking, and fishing. Similar to the existing facilities, the proposed community dock facilities would be usable throughout the year. The two community docks at Jefferson Park would provide permanent moorage for 38 boats, and convenient reservoir access to the interior lot owners who would otherwise have less convenient access to the reservoir.

It is the applicant's intent to provide a unified subdivision opportunity for all residents, without the appearance of exclusivity. In addition, both TVA and the Corps have given approval for private docks and associated water use facilities for the 35 waterfront lots within the development. Not all 73 boats from these community and individual docks are expected to be on the reservoir at the same time. During the recreation season, an increase in boating activity

and usage would occur. Based on TVA staff observations in the vicinity of the proposed private water use facilities, on Fort Loudoun Reservoir, and on other TVA reservoirs, recreational boaters maintain similar patterns. As a result, TVA assumes that about 25 percent of boats stored at these new facilities are likely to be in use during a typical summer weekend day and 35 percent on a peak-use summer holiday weekend. Therefore, the proposed facility would result in up to 18 additional boats on the reservoir on a typical weekend day during the boating season and an estimated 26 additional boats during a summer holiday weekend. This is supported by analysis contained in a recent TVA (2008) technical report. Water-related recreational boating is generally less on weekdays during the summer season (Memorial Day through Labor Day) and further reduced by about 20 percent of peak summer season from mid-April up to Memorial Day and Labor Day up to mid-October. Recreational boating is expected to further reduce, even on weekends, during the wintertime (to about 10 percent of peak summer from mid-October to mid-April).

It is also assumed that, as a staging area, some boaters would motor out of the embayment and onto the main river channel to pursue their boating pleasures. With the increased reservoir access and moorage, water-related recreation opportunities such as boating, fishing, and leisure time activities would most likely increase as well. This would provide a positive benefit and attraction for the residents and potential homeowners. Because this increase would not be large and would be achieved gradually during subdivision build-out, the increased demand and use would not significantly affect overall reservoir (water-related) recreation. Increased use within this area would not jeopardize recreational boating on Little Turkey Creek embayment or Fort Loudoun Reservoir, as long as recreational boaters follow safe boating practices, State of Tennessee boating laws, and the U.S. Coast Guard (USCG) recommended safety zones around commercial boat and barge traffic. Although there would be a slight increase in recreational boating traffic, it is expected that this impact on recreational boating opportunities would be minor and safety would not be reduced. To support safe boating, the applicant would install signage at visible locations on the two community docks and boat ramp encouraging safe boating practices (see Section 5.2).

**(x) Navigation.** The applicant owns approximately 4,890 linear feet of water frontage, with sections reserved for common use at the two community dock locations (see Appendix A). Thirty-five additional docks have been approved along the shore fronting individual subdivided lots. There are numerous private docks and/or community docks within Little Turkey Creek embayment. Montgomery Cove community area (and community dock) is located immediately adjacent to Jefferson Park Subdivision. There are also four other community docks in the immediate vicinity of Jefferson Park Subdivision. They include The Woods at Montgomery Cove, Preston Park, and two separate community facilities in Mallard Bay Subdivision. These docks are all directly across the embayment. There are also two other community access areas in the Little Turkey Creek embayment in the Lakewood and Lakeside Estates communities. See Figure 2 for a map of the neighboring subdivisions. Specifically, Montgomery Cove adjoins the proposed development south of Common Lot #1 (Dock A) boundary line. Dock A would be located within the center of the 5.29-acre common lot and would extend no more than 103 feet from normal summer pool elevation 813 msl (much less than one-third of the creek channel width estimated at 700 feet). Community Dock B would be located on 1.69-acre Common Lot #2 within a small cove of the same channel. These Jefferson Park Subdivision community docks would be located along a total of 1,334 linear feet of shoreline.

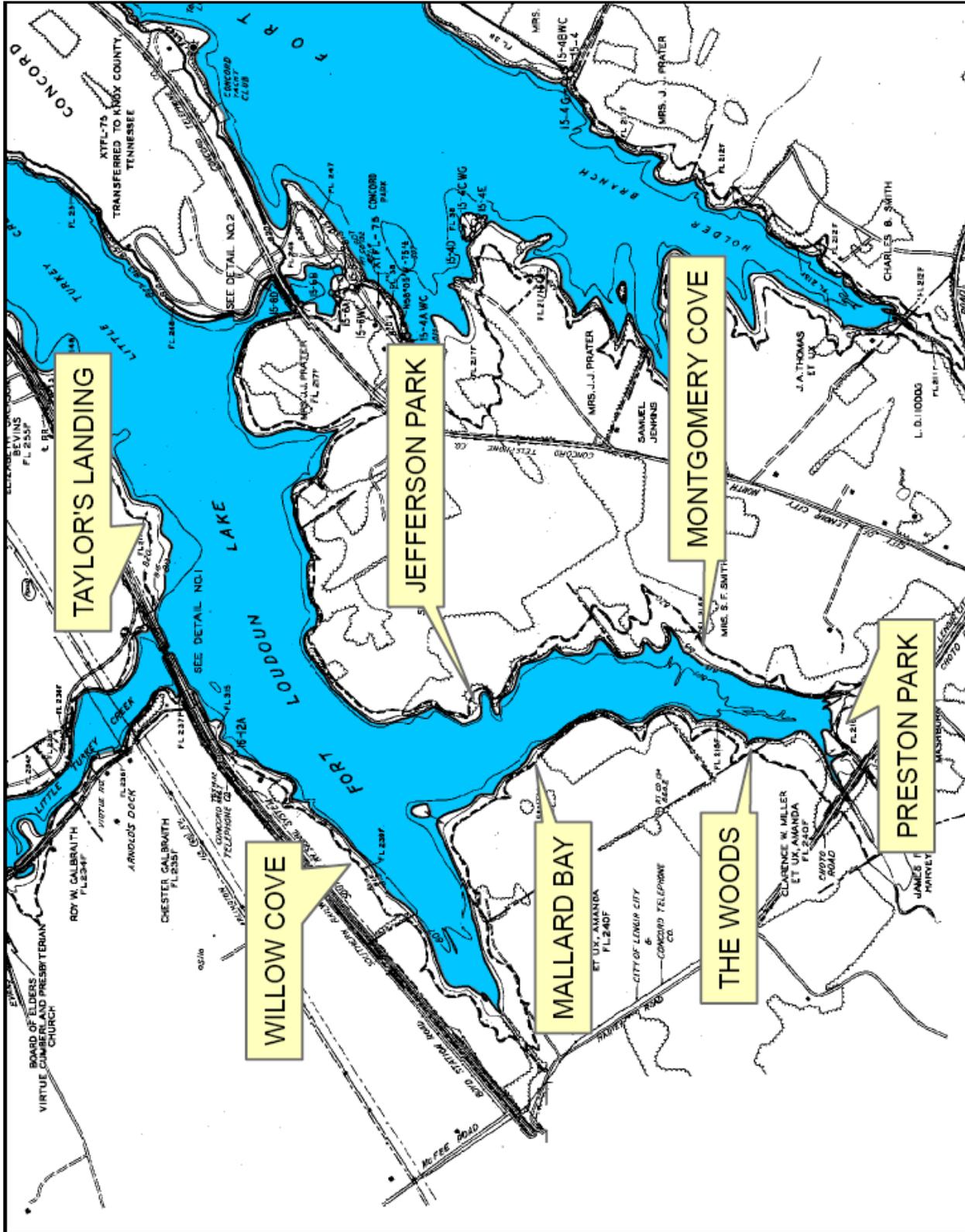


Figure 2. Map of Neighboring Subdivisions

Lot owners with individual covered docks and associated facilities would be located along the shore north of Dock B along the remaining shoreline. Because the community dock facilities would be located well away from the normal navigational channel, they are not expected to impede recreational boating traffic to or from other existing individual and community docks in the embayment. The Section 26a and RP approvals for the private waterfront lots restrict dock size and activities that can be performed, thereby eliminating the potential for larger facilities and vessels. Even with the anticipated construction of private dock facilities within the subdivision, the ingress, egress, and moorage of vessels from this proposed development would not impede or obstruct recreational navigation near these facilities or existing ones within Little Turkey Creek.

Special conditions would also be required for safety lighting in accordance with USCG standards to minimize navigational hazards (see Section 5.2). Although there would be a slight increase in recreational boating traffic, it would only be a minor site-specific adverse impact (see Water-related recreation section above and the Safety section below). Therefore, TVA and the Corps expect that there would be no individual or cumulative adverse impacts on recreational boating opportunities or navigational safety.

( ) **Traffic/transportation patterns.**

( ) **Energy consumption or generation.**

(x) **Safety.** Installation of lights on the community dock structures would provide a safety measure to reduce the potential for navigational accidents (see Section 5.2). Although there would be a slight increase in boating traffic, the contribution of boats from residents of Jefferson Park Subdivision is not expected to significantly reduce safety for the boating public on this reach of Little Turkey Creek and on Fort Loudoun Reservoir. Recreational boaters would be expected to follow safe boating practices, State of Tennessee boating laws, and USCG-recommended safety zones around commercial boat and barge traffic (see Water-related recreation and Navigation sections above).

(x) **Air quality.** There would be a temporary increase in fugitive dust and equipment emissions during construction of docks, riprap stabilization, and other shoreline improvements. From an individual and cumulative impacts' perspective, because of the small amount of dust generated during dry conditions, the incremental increase and resultant impact of this proposal would be minimal.

(x) **Noise.** A Norfolk Southern Railroad (NSR) track runs in a northeasterly direction approximately 800 feet northwest of the Jefferson Park Subdivision site on shoreline and causeways on the opposite shore of the Little Turkey Creek embayment. Based on staff observation of this section of railroad through the Boyd Station area, NSR schedules run all hours of the day and night, seven days a week, depending on their customer payloads. They appear to transport chemicals, vehicles, farm and military equipment, coal, sand, salt, oil, and grain, among other goods and products. Trains blow their horns at three locations nearing road crossings along this portion of the NSR track. Some regular but generally low amount of boating, low to moderate road vehicle noise, as well as common sounds of a suburban countryside residential area, provide the preponderance of other background noise.

The applicant chose to remove some trees and brush, primarily on the upland areas of his property during the process of TVA and Corps review of his proposed community docks and other shoreline alterations. Since wooded areas with dense trees and underbrush can attenuate sound, removal of vegetation and other barriers between noise generators and

receptors can cause a corresponding increase in the volume of some sound. Removal, modification, or establishment of vegetation on privately owned shoreland subject to TVA flowage easements does not require approval by TVA (see Land use classification below).

The area, including nearby residential properties surrounding the embayment, would be temporarily impacted by daytime subdivision construction noise and permanently impacted by the anticipated slight increased use of the waterway, especially during the peak recreational season. However, such a small increase in noise, compared to the existing noise from frequent trains, would be insignificant. Overall, because these effects would be seasonal and increase gradually as the subdivision nears build-out, this would be a minor site-specific and cumulative impact.

**(x) Land use classification.** The applicant owns approximately 158.4 acres adjacent to neighboring private ownership. Approximately 127 acres of this land, located above normal summer pool elevation 813 msl, are proposed for development. Within the area proposed for development, the applicant has reserved 12 acres for public green space and 1,334 linear feet (of the 4,890 linear feet) of shoreline for the community facilities. The community facilities would be located on 6.98 acres divided between two common lots, accessed by walking trails throughout the Jefferson Park Subdivision. Out of 299 homesites, 35 are waterfront lots.

TVA has acquired certain rights over private land proposed for development as a part of Jefferson Park Subdivision on its flowage easement below elevation 820 msl. These rights, over TVA Tracts FL-315, 239F, and FLCR-45, include the right to permanently overflow, flood, or cover the land with water; the right to enter upon the land to remove timber, vegetation, or other obstructions to do such drainage work as needed to conduct an adequate program of malaria control; and to excavate, erect structures, and conduct work in connection with the needs of navigation.

The Little Turkey Creek embayment is jurisdictionally divided between Knox County (generally described as south of the NSR) and the town of Farragut (generally described as north of the NSR). Jefferson Park Subdivision is located south of the NSR. All of the embayment property north of the NSR is water accessible via bridge openings under the railroad right-of-way to access the main Tennessee River channel. Information on properties north of the NSR in the town of Farragut was obtained from Farragut Town Hall records. Information on properties south of the railroad in Knox County was obtained from [www.kgjis.org](http://www.kgjis.org).

Mallard Bay and The Woods at Montgomery Cove are zoned at a range of one to three dwelling units per acre; Preston Park is zoned at one to three dwelling units per acre, and Montgomery Cove at 2.4 dwelling units per acre. Zoning of other subdivisions and property in the area that precede current zoning regulations were developed in the range of one to three units per acre. Jefferson Park's zoning restriction at 2.5 dwelling units per acre is consistent with the general zoning in the embayment area. Its development in the manner proposed is also consistent with all other applicable zoning and land use regulation and ordinances for this location in Knox County. During 2008, both the Knox County Commission and the Knoxville/Knox County Metropolitan Planning Commission reviewed and approved the subdivision development proposal.

Undeveloped property in the embayment area is zoned agricultural.

**(x) Conservation.** The applicant would preserve some natural vegetation throughout the development and plant new trees where practicable within the common grounds to promote stability. The applicant has reserved 12 acres of upland green space on the

developed property, with plans to include walking trails that would access the common grounds. The proposal also includes installation of riprap for shoreline protection at the community docks. The Corps and TVA have reviewed preliminary plans for facilities that would likely be located on the 35 waterfront lots, with the expectation that those facilities meet both the Corps and TVA permit approvals. Therefore, the applicant has made an effort to minimize individual impacts along the shoreline. Furthermore, the applicant has agreed to plant a native vegetative buffer to reduce visual impacts on the existing Prater farm (see Historic properties and cultural values section below).

**(x) Aesthetics.** As discussed earlier, the shoreline and upland area have already been disturbed due to initial roads, utilities, and a few homesite developments above elevation 820 msl within the subdivision. However, the proposed individual and community docks and other shoreline improvements are similar in nature to the existing residential communities and associated shoreline developments within Little Turkey Creek embayment. Some viewers of the new development may notice a slight reduction in the natural aesthetic values of the embayment from their viewing positions. However, with the implementation of special conditions below, the dock construction would be a minor site-specific adverse visual impact that could be absorbed by the surrounding lake environment.

- **Structures** - All color schemes for roofs and boat slip exteriors would be visually compatible with natural background colors (dark green, gray, or brown hues).
- **Lighting** - All lights used on the approved water use facilities would be fully shielded or have internal low-glare optics, such that no light is emitted from the fixture at angles above the horizontal plane. Shielded low pressure sodium lamps would be used during the construction and operational phases. Area lighting would be on poles no taller than 40 feet, unless they are lighting objects taller than 40 feet. In such cases, pole heights would be minimized.

**(x) Historic properties and cultural values.** Initial consultation with the Tennessee Historical Commission (THC) was conducted for the proposal through the public notification process (see Appendix A). Prior to issuance of the JPN, a field reconnaissance by TVA Cultural Resources staff found evidence of a historic artifact scatter within the Dock B project area. Review of the TVA land acquisition maps identified a historic homestead that included a one-story log and frame structure, a shed, and an outhouse (40KN300 further described below) at this location. In compliance with requirements of Section 106 of the *National Historic Preservation Act*, TVA requested a Phase I archaeological survey of the area from the applicant. A report entitled *Cultural Resources Survey (Phase I) of the Proposed Jefferson Park Subdivision off Northshore Road, Knox County, Tennessee* (Manning 2008), prepared by the applicant's consultant, was supplied to TVA and the Corps. The area of potential effect (APE) for archaeological resources was defined as the remaining area that had a potential to contain intact archaeological resources. This area includes the 37 waterfront lots in the subdivision (35 individual waterfront lots and the 2 common lots fronting the proposed community docks). TVA defined the APE for historic structures as the subdivision plus any areas from which the project area would be visible that may contain historic resources. The size of the APE beyond the subdivision was dependent on factors such as topography and vegetation (line of sight) or 0.5-mile radius boundary, whichever was closer to the action being considered for federal approval.

Two new sites were recorded within the project APE as a result of the archaeological survey. Site 40KN300, the homestead described above, was considered ineligible for listing in the NRHP because no intact deposits or features were identified. Site 40KN301 is a remnant of a

late 19th-century rock quarry, with a few artifacts present. Due to the quarry being dramatically altered by the inundation of Fort Loudoun Reservoir and because it lacks integrity, this site was recommended as ineligible for listing in the NRHP.

The historic structures survey identified three historic structures within the architectural APE. The first structure, the Elsie Prater farm, consists of a large red barn (HS 1) and a smaller structure (HS 2) on the north side of Northshore Drive and a farm complex that includes a smokehouse, well house, and barns in addition to other buildings on the south side of Northshore Drive (Figure 3 in THC correspondence in Appendix E). The Elsie Prater farm is considered eligible for listing in the NRHP. The farm has previously been certified as a Century Farm by the Center for Historic Preservation at Middle Tennessee State University. The other two structures are located north of the reservoir on Boyd Station Road. One is an old barn that has been converted into boat storage and a garage and the other is a modern farm that contains a barn and other outbuildings that appear to be about 50 years old or older. These two structures are recommended as ineligible for listing in the NRHP due to significant alterations to the original structures (Manning 2008).

By letters, both dated 23 May 2008, TVA provided a copy of the survey report along with its APE determination and effects findings to the THC and Indian tribes with potential interests in the proposal. TVA, during prior discussions with the THC, determined that a vegetation buffer would be needed to reduce visual effects on the Prater farm historic structures. Based on these discussions, by letter dated 11 June 2008, THC concurred with TVA's determination that the project would not adversely affect any property that is eligible for listing in the NRHP (see Appendix E). By letter dated 27 June 2008, the applicant committed to planting trees to create an 800 linear foot long visual buffer zone. Over time, this would permanently extend the adjacent line of mature trees bordering the applicant's land and the Prater farm. The applicant would plant these trees, but would then require each individually affected property owner to maintain the tree buffer on his or her property. Each property would be identified on the final plat map with a "Do Not Disturb" restriction and Maintenance Requirement Buffer Zone restriction (see Section 5.2).

By 28 May 2008 stamped copy of the TVA letter dated 23 May 2008, TVA received a no objection statement from The United Keetoowah Band of Cherokee Indians in Oklahoma. In addition, by letter dated 29 May 2008, TVA received a determination that there would be no significant impacts from the project from the Jena Band of Choctaw Indians. By e-mail with an attached letter dated 8 July 2008, the Tribal Historic Preservation Officer of the Eastern Band of the Cherokee Indians concurred with TVA's recommendation that archaeological sites 40KN300 or 40KN301 are not considered eligible for inclusion in the NRHP and indicated that the project could proceed as planned.

By letter dated 15 May 2008 to the Corps, the THC responded to the JPN and requested a detailed archaeological survey report of the APE (see Appendix E). The APE subject to the survey included the project shoreline and an area sufficient to cover the landward depth to the waterfront lots and lakeward extent of the ramp, courtesy pier, gazebo, and other proposed community structures. TVA supplied the THC with a copy of the survey report (Manning 2008). By letter also dated 15 May 2008, the Corps requested concurrence from THC on a no effect finding. By letter dated 19 May 2008 to the Corps, the THC concluded that the project may adversely affect properties that are eligible for listing in the NRHP. Further coordination revealed that this particular comment was directed at the visual impacts that may occur to the potentially eligible Prater farm. By e-mail correspondence dated 29 May 2008, the THC concurred with the Corps' findings that no archaeological properties listed or eligible for listing in the NRHP would be adversely affected by the undertaking. With the vegetative screening

commitment below, the Corps, by letter dated 6 August 2008, also requested concurrence from the THC on its finding that the project would have no adverse effect upon historic structures. By letter dated 5 September 2008, the THC concurred with the Corps that the project, as proposed, would not adversely affect any NRHP-listed property so long as a line of vegetative screening between the project and historic property is planted before construction begins (see information below and special condition in Section 5.2). By letter of 5 March 2009, THC finds that the project as currently proposed will not adversely affect any property that is eligible for listing in the NRHP and has no objection to the implementation of the project (see Appendix G).

The planting of trees to serve as a visual buffer between the subdivision and the Prater farm would be accomplished in accordance with the following planting plan:

- Either Virginia pines, eastern red cedars, or a mixture of the two species would be planted immediately upon receipt of shoreline alterations approvals from the Corps and TVA. These trees would be a minimum of 1.5 to 2 inches in diameter at ground level when planted. These native, container-grown trees must be planted by you, the applicant, who guarantees survival and agrees to replant any tree that dies immediately or no later than the next planting season (November through January or within one year). Trees would be planted in two rows, 800 linear feet long, staggering or alternating rows along the buffer area designated in Figure 2 of the TVA correspondence dated 23 May 2008 in Appendix E. Each row would contain trees spaced 15 feet apart and the rows would be placed 7 feet apart. Applicant would comply with the planting design shown in Appendix F.

**(x) Economics.** The proposed action would allow the applicant to fully utilize the property to derive economic benefits from his investment. The proposed action would provide additional amenities for the homeowners within the new subdivision and presumably increase property values. Because the proposal is similar in nature to the existing neighborhood facilities, it would not have a negative effect upon currently owned or future properties of these nearby subdivisions. State and local revenues may also be generated with the increased property tax values and associated additional recreational spending. During development and construction, there would be a temporary but small positive impact on sales of construction-related goods and services and on income and employment in the local area. However, this impact likely would be minor and insignificant at the county or regional level.

Similar to water frontage, it is well established that a water view or an open space view adds value to property (Benson et al. 2000; Irwin and Bockstael 2001). Irwin (2002) found that the property value impact is significantly greater if the open space is preserved, rather than being developable. Earnhart (2006) found, more recently, that benefit from open space adds no value if it is potentially short-lasting, while preserved open space adds about 5 percent to housing value. While negative impacts due to obnoxious and noticeably discordant views are generally acknowledged, views that are not discordant and cause no physical harm are likely to have an insignificant impact on property values. With regard to the proposed Jefferson Park Subdivision, the development restrictions are as strict as or stricter than those in the existing developments around the embayment. None of the proposed actions are expected to be discordant in contrast to the existing developments. Therefore, it is unlikely that any noticeably negative long-term impacts to property values would occur; should they occur, it likely would be due to failure to recognize that the same or similar standards would apply to Jefferson Park that apply to the other areas on the embayment.

( ) **Floodplain values.** See Flood control functions and Land use classification sections.

(x) **Consideration of private property.** There are no known encroachments on other property owners or landrights resulting from this proposal. The potential visual impact of the proposal upon the adjacent historic Prater farm (northeastern boundary) has been addressed via a required buffer zone along the boundary line. Because property values and development standards levied by the Jefferson Park Homeowners Association and those of nearby communities would probably ensure community viability, no neighborhoods would be significantly impacted by the proposed development.

( ) **Food and fiber production.**

( ) **General environmental concerns.**

( ) **Mineral needs.**

( ) **Other.**

### **3.5 Cumulative and Secondary Impacts**

Cumulative environmental effects for the permitted individual and proposed community docks are assessed in accordance with guidance provided by the President's Council on Environmental Quality for NEPA reviews. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. The Corps and TVA consider every permit application on its own merits and assess its environmental impacts within the proper scope of review for NEPA purposes. The scope of analysis for this permit application includes the shoreline and near-shoreline area where the structures would be placed, the immediate upland areas directly affected by construction and residential use of the property, and the approximate 2.5-mile-long Little Turkey Creek embayment to its confluence with Turkey Creek at the mouth of the Tennessee River.

All water use facilities approvals in Little Turkey Creek embayment have been issued along residential access shoreline where the applicant either owns land to the normal summer pool elevation (as is the case here) or has deeded rights of ingress and egress to the reservoir for the purpose of applying for water use facilities. As proposed, these water use facilities meet TVA's current regulatory requirements. The cumulative effects of such approvals, on a reservoir systemwide basis, have also been evaluated in the *Shoreline Management Initiative Environmental Impact Statement* (TVA 1998) for the Tennessee Valley.

In addition to the current Jefferson Park proposal, seven residential subdivisions and other scattered homesites already occur around the Little Turkey Creek embayment. These subdivisions include Lakewood, Willow Cove, Lakeside Estates, Mallard Bay, Montgomery Cove, Preston Park, and The Woods at Montgomery Cove (See Figure 3 for map of subdivisions, undeveloped private land, and public parkland in Little Turkey Creek embayment). These developments have previously been issued 88 federal approvals for shoreline alterations and individual facilities. Similarly, 28 other individual permit approvals have been issued at other homesites in the embayment upstream of the Northshore Drive bridge at the confluence of Little Turkey and Turkey creeks. Along with facilities proposed for Jefferson Park, there would be about 150 permitted individual and community water use structures in Little Turkey Creek embayment. Community docks and other day use facilities

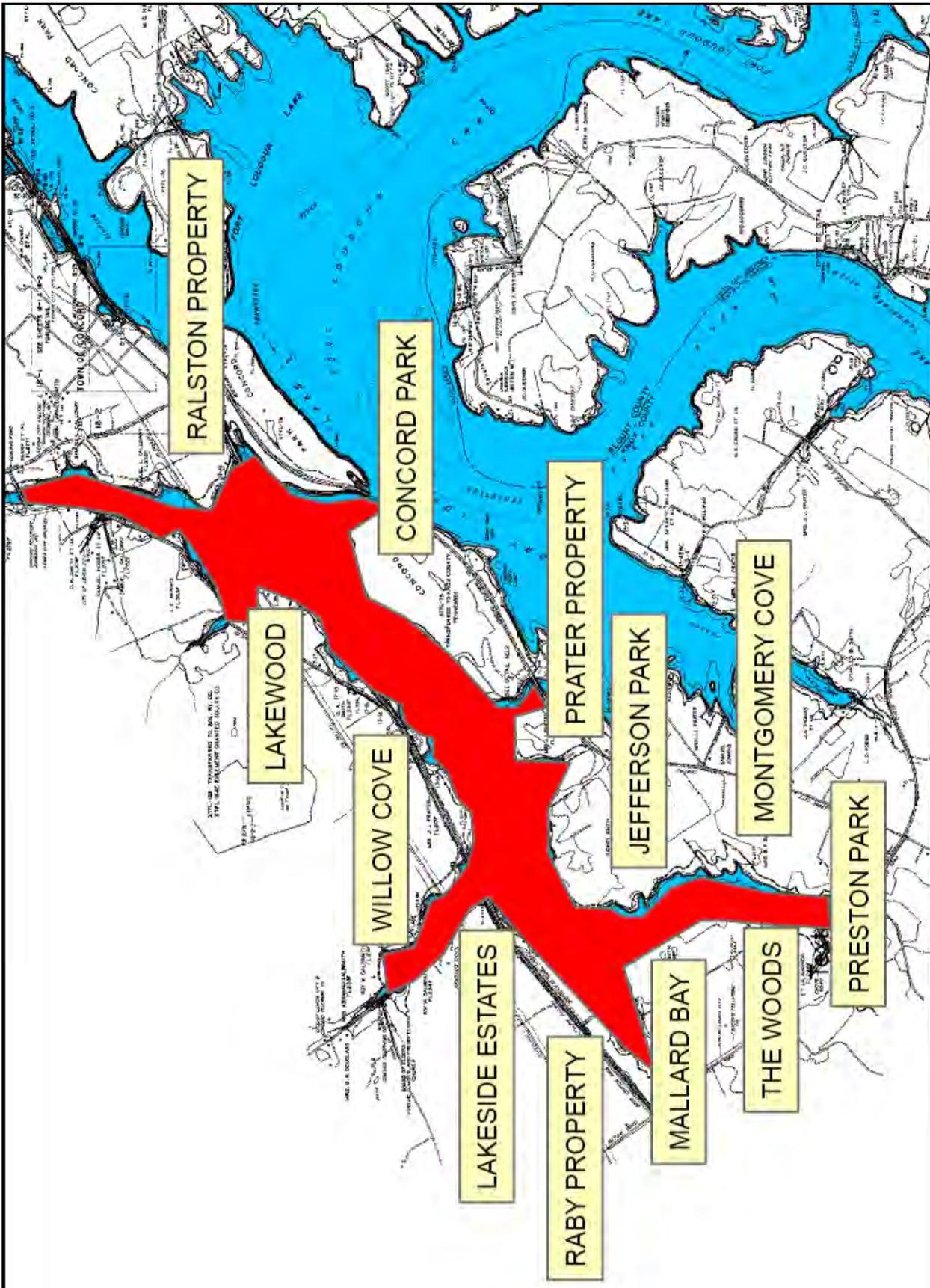


Figure 3. Map of Subdivisions, Undeveloped Private Land, and Public Parkland in Little Turkey Creek Embayment

supporting about 400 homeowners have been approved in association with the Mallard Bay, The Woods at Montgomery Cove, Preston Park, Lakewood, and Lakeside Estates communities. A part of Concord Park, operated on land transferred from TVA to Knox County, also occurs in this embayment. Along with approved shoreline stabilization, a ski course, a public access ramp, and fishing piers, the embayment offers a variety of water-oriented and other land-based outdoor public recreational use opportunities. An estimated 70 acres of land that has some 3,900 feet of shoreline presently remains undeveloped in Little Turkey Creek embayment.

The proposed Jefferson Park facilities would provide improved reservoir access, additional amenities, and water-related recreation opportunities for the residents of the new subdivision. It would also be economically beneficial to the applicant in realizing a return on his investment. The local economy would likely benefit from revenues associated with recreational spending and increased property values. Special conditions added to the DA and TVA approvals would reduce overall project impacts. Construction and use of these facilities would result in insignificant impacts upon the aquatic and terrestrial resources as discussed above. There would be minor, temporary site-specific and cumulative adverse impacts on aquatic habitat, common wildlife and plant communities, and navigation and a slight reduction in nature aesthetic values for some residents around this embayment. Construction noise levels combined with roadway noise would be slightly higher but temporary in duration. Once development work is completed, along with natural revegetation, and implementation of BMPs, including mulching, grass and other planted vegetation, and site and shoreline stabilization, TVA and the Corps do not believe that the contribution of sediments from erosion or other pollutants from construction and use of the proposed facilities would significantly worsen current water quality in the Little Turkey Creek embayment (see Water quality section).

Given the relatively small amount of remaining private undeveloped shoreland around the embayment, build-out of the area may be approaching depending on market forces within the housing industry, although the timing and nature of the expected build-out are unforeseeable. Although undeveloped tracts of land occur, there are no other known proposed residential or associated shoreline developments planned at or near these locations at this time. Parkland, about 1 mile downstream from the subdivision, would likely only be developed consistent with demands for public recreation and plans developed by Knox County and approved by TVA. Boaters could be inconvenienced by increased users at public access ramps and docks on summer weekends and holidays (see water-related recreation section). Previously approved shoreline development and alterations have been conditioned to minimize their individual and cumulative impacts. Similarly, future development permitted by the Corps, TDEC, and TVA would likely be conditioned to protect the environment and avoid or individually and cumulatively reduce adverse impacts on the lake environment.

The increased demand for residential living along waterfront properties, associated water-related recreation, and uses of available natural resources would result in minor site-specific and cumulative adverse impacts upon the aquatic and terrestrial environments. However, through the exercise of their respective regulatory jurisdictions, the Corps, TVA, and TDEC maintain considerable control over potential shoreline development through various land management programs and the permitting process as evidenced by this EA. Appropriate mitigative conditions are typically required, if necessary, to offset anticipated impacts from future developments.

When considering the impacts from past, present, and reasonably foreseeable future proposals, the cumulative and secondary impacts from this proposal on these natural resources in Little

Turkey Creek embayment, Fort Loudoun Reservoir, and in the area are considered a minor and insignificant impact.

## **CHAPTER 4.0 Public Involvement Process (Consideration of Public Comments)**

### **Initial Public Scoping**

On 12 May 2008, the Corps and TVA issued JPN 08-11 (see Appendix A) to advertise the proposed work and to determine the overall public interest of the proposal. The USFWS and the THC were the only responding resource management agencies. Their comments are addressed above in the appropriate sections. Ten individuals, along with 112 petitioners, expressed their views on the proposal. Several requested a public hearing and/or permit denial (see Appendix E). Their comments are addressed above in the appropriate sections. These responses are detailed collectively below.

Prior to issuance of the public notice, in a letter dated 11 March 2008, Kramer Rayson LLP, as attorneys for Mallard Bay Subdivision Homeowners Association (Mallard Bay HOA), cited the HOA's objections to the proposal and requested permit denial based upon the increased boat traffic, congestion, and additional docking privileges that would be granted to interior lot owners. Likewise, by letters dated 22 April 2008 (to TVA), 26 May 2008 and 4 June 2008 (to the Corps), Realty Resource Systems (Board of Directors of Mallard Bay Subdivision) cited similar objections, requesting a public hearing and permit denial, which was also supported by a written petition of 112 individuals residing in Mallard Bay Subdivision.

Six letters were received between 2 June 2008 and 9 June 2008 from individuals residing within the nearby Mallard Bay Subdivision, each citing his or her concerns about and/or objections to the proposal. Of these, five commenters requested a public hearing. Three commenters requested permit denial.

Collectively, these six responses identified issues and concerns pertaining to increased noise, fuel spills, trash and litter, wave activity, erosion, and congestion that could likely result. Commenters stated that Little Turkey Creek is shallow, with limited water flow and circulation, yet it withstands heavy recreational traffic already due to the existing private dock approvals within Mallard Bay, Montgomery Cove, The Woods at Montgomery Cove, and Preston Park subdivisions, and other public use facilities. Also cited were concerns for navigational and swimming safety resulting from increased boat usage and the presence of (anticipated) high-speed boating vessels. Specific concerns were cited regarding the proposed combined approvals of community docks (that allow for additional docking and usage by interior lot owners) and private docks within residential developments, which also result in these increases. One commenter opposed the construction of waterfront facilities for the use of interior lot owners, contending that this activity may devalue the existing waterfront lots/homes because of the availability to obtain water access without paying for a waterfront lot.

By letter dated 4 June 2008, Jerry Felix, President of The Woods at Montgomery Cove Homeowners Association, on behalf of the Board of Directors, also responded to the JPN, citing similar concerns, and requested permit denial. He further stated that the community facilities constructed for the use of interior lot owners would benefit the developer (applicant) and residents of that subdivision, rather than those of the general public.

By letter dated 17 June 2008, the Corps acknowledged each responder's concerns and objections, noting that all comments would be considered in the evaluation of the proposed

project. The applicant was notified and was forwarded all comments, requests, and objections, and was given the opportunity to resolve and/or rebut them, as appropriate. In response to the above, the applicant met with the Mallard Bay HOA to address their concerns and answer questions regarding the proposal.

By letter dated 19 June 2008, the applicant responded with his rebuttal in support of the proposal as planned (see Appendix E). In his letter, he outlined the collective concerns of the responders. He stated that he designed the size and location of the docks to meet TVA requirements and set aside nearly 10 percent of the entire project acreage for green space and common use areas. With respect to boat traffic and navigational safety, he cited existing individual dock permits, which include but are not limited to, the objecting Mallard Bay and The Woods at Montgomery Cove Homeowners Associations. He does not believe that the increased noise, fuel/pollution, and wave activity would be significant in light of the existing facilities and uses. He further stated that there would be no fueling capabilities at the community docks. He suggested that swimming and fishing opportunities would increase with the additional common grounds for use by the Jefferson Park Subdivision residents.

With regard to the appearance of community docks for use by interior lot owners, the applicant contended that these facilities would be constructed of similar materials and size of existing nearby facilities. They would be owned by the homeowners association, once formed, and would not be a for-profit enterprise. Any revenues would be returned to the association for maintenance, ensuring long-term safety and integrity of the structures. The facilities would allow access to the reservoir amenities, otherwise not afforded property owners who are not financially able to purchase waterfront lots. In support of his proposal, he pointed out that the docks are not unlike the existing facilities located at each of the above subdivisions. Specifically, Mallard Bay has a community dock for specific lots (Numbers 24, 25, and 26 in Unit 4), with access to the reservoir via an easement across Lot 23R. In addition, Mallard Bay had another separate dock location and a launching ramp. He also indicated that he has reduced the size of each dock, and has designed each to fit the proposed location, with consideration for navigational safety (distance to others) and visual impacts upon the nearby subdivisions. He contended that his proposal is similar to the existing surrounding residential environment.

After expiration of the JPN comment period, one individual, Barry N. Totten, a Mallard Bay resident, submitted a letter to the Corps via e-mail dated 15 August 2008 (copy to TVA) that expressed concerns about erosion, specifically relating to the applicant's recent activities involving removal of the shoreline vegetation. He stated that the applicant's activities have caused increased sedimentation into the cove and a continuing deterioration of the riverbank. He requested a stay in processing the permit until (1) a ground survey is conducted by the Corps, TVA, and state personnel, (2) a public hearing is conducted, and (3) the developer submits an appropriate mitigation/restoration plan.

By e-mails dated 19 and 20 August 2008, TVA and the Corps, respectively, acknowledged Mr. Totten's concerns, and forwarded those concerns to TDEC and the applicant.

Lastly, Joe R. Judkins, the attorney representing The Woods at Montgomery Cove, sent a letter dated 18 August 2008, to both the Corps and TVA citing the adverse effects the proposal would have upon the neighboring subdivision properties. Mr. Judkins cited opposition to the proposal on behalf of the homeowners association. He specifically cited concerns for navigational safety within the cove between The Woods at Montgomery Cove and Jefferson Park subdivisions, stating that the cove is narrow and shallow and is not appropriate for high-speed boating traffic. He requested a "no wake" zone to reduce unreasonable interference in the safety of The Woods

Subdivision. He also requested all records and supporting documentation pertaining to the proposal of Jefferson Park Subdivision, under the *Freedom of Information Act* (FOIA), recommending permit deferral until he had an opportunity to review and discuss the contents with his clients.

By letter dated 6 October 2008, the Corps acknowledged the concerns expressed by Mr. Judkins on behalf of The Woods Subdivision residents and responded to him with a copy of the file contents to date. TVA earlier responded to the same FOIA request from Mr. Judkins with information transmitted by letter dated 28 August 2008.

As stated earlier, the applicant was notified and forwarded all comments, requests, and objections, and was given the opportunity to resolve and/or rebut them, as appropriate. All responses to the JPN have been received, considered, and addressed in this final EA. These comments are included in Appendix E. Additional comments, received in response to review of the draft environmental assessment (DEA), have been taken into account in this final EA (see Comments on the DEA below).

In conclusion, the applicant has designed the facilities in accordance with all applicable Corps and TVA permitting requirements and policies. The applicant has the right to reasonable private use of his property. The applicant has considered the potential impacts and has made modifications to his plans in an attempt to resolve concerns of the public. Additionally, he has proposed to construct facilities that meet either a DA NWP or RP in order to minimize impacts to the environment. The placement of buoys and posting of designated "no wake" zones is within the jurisdiction of the Tennessee Wildlife Resources Agency and thus, cannot be required by the Corps or TVA.

#### **Comments on the DEA**

On 3 March 2009, TVA sent the DEA to 30 individuals including representatives of various federal, state, and local agencies. This includes some individuals who provided written comments on the JPN (see initial public scoping comments above and in Appendix E). The DEA was posted on the TVA external Web site, at <http://www.tva.gov/environment/reports/>, and thus made available to the general public. It was also made available for public review at the Farragut Branch Public Library. Postcards were mailed to 77 other private citizens who were among those that signed a petition, forwarded to the Corps, in opposition to the proposal. These postcards announced the availability of the DEA at the library, online, or through two local homeowners' associations. The applicant had previously provided a rebuttal to the initial scoping comments and this rebuttal was included in the DEA and in Appendix E of the final EA. TVA requested that all comments be submitted on the contents of the DEA by 2 April 2009. The DEA contained information, plans, and an evaluation of effects of the applicant's proposal for construction and operation of the two proposed community docks and shoreline stabilization.

In response to review of the DEA, comments were received from the one local organization, East Tennessee Development District (ETDD); two state agencies, TDEC, Division of Recreation Educational Services, THC; and one federal agency, USFWS. TVA and the Corps received 10 letters by mail, e-mails, or online via the internet, representing the views of 12 citizens.

By letter dated 2 April 2009, USFWS states that available records do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project. It further indicates that requirements under Section 7 of the *Endangered Species Act of 1973*, as amended, are fulfilled. By letter of 5 March 2009, THC finds that the project as

currently proposed will not adversely affect any property that is eligible for listing in the NRHP and has no objection to the implementation of the project. In its letter of 17 March 2009, TDEC indicates that the project would not impact either a federally or state recreation funded grant administered by the division. By letter dated 5 March 2009, the ETDD indicates that it found no conflicts with its plans or programs or with plans or programs of other Agencies in the region. Several individuals continued to express concerns about boating traffic, water pollution, navigation and safety, aesthetics, and noise. A few individuals expressed concerns about perceived dissimilarities in the appearance and operation of the proposed community docks and potential project-related effects on property values. As a part of the review of these comments, TVA and Corps staff specialists inspected the site in the vicinity of the proposed community docks on 3 April 2009 and 8 April 2009. All relevant issues raised in these comments have been addressed in this final EA (see additional correspondence included in Appendix G).

## **CHAPTER 5.0 Other Considerations and Approvals**

### **5.1 Consideration of TVA Comments and Approval**

As a cooperating agency, TVA was party to the JPN and was provided copies of comments received from the above responders. TVA was also provided a preliminary copy of the DEA for review and comment.

### **5.2 Special Permit Conditions Consideration**

The following special permit conditions are necessary to comply with federal law, while affording appropriate and practicable environmental protection. Some of these conditions are routine TVA requirements.

1. The work must be in accordance with the plans and information submitted in support of the proposed work. You must have a copy of this permit available on the site and ensure that all contractors are aware of its conditions and abide by them. *Justification: Recommended at 33 CFR 325, Appendix A.*
2. You must install and maintain, at your expense, any safety lights and signals prescribed by the United States Coast Guard (USCG), through regulations or otherwise, on your authorized facilities. The USCG may be reached at the following address and telephone number:

**Commander, Eighth Coast Guard District  
Hale Boggs Federal Building  
500 Poydras Street  
New Orleans, LA 70130  
Telephone: (504) 671-2328**

*Justification: Recommended at 33 CFR 325, Appendix A.*

3. Your use of the permitted facilities must not interfere with the public's right to free navigation on all navigable waters of the United States. *Justification: Recommended at 33 CFR 325, Appendix A.*
4. You recognize the possibility that the dock structures permitted herein may be subject to damage by wave wash from passing vessels. The issuance of this permit does not relieve

you from taking all proper steps to ensure the integrity of the structure and the safety of boats moored thereto from damage by wave wash and you shall not hold the United States liable for any such damage. *Justification: Recommended at 33 CFR 325, Appendix A.*

5. All site preparations shall be conducted in a manner which minimizes siltation of the reservoir. A strict erosion and sediment control program utilizing best management practices must be instituted and maintained for the life of the project to effectively reduce runoff, erosion, and sedimentation. Some of these methods may include, but are not limited to, ground cover blankets, check dams, slope drains, entrenched silt fences, staked hay bales, sediment traps, etc. All disturbed areas must be properly stabilized as soon as practicable after construction. The applicant shall accomplish this site stabilization by seeding, planting, and mulching with herbaceous and woody species native to the area. *Justification: To minimize water quality impacts by maintaining buffers between upland development and the aquatic resource.*
  
6. In accordance with your commitment letter dated 27 June 2008 and attached map, you must institute and implement a native planting plan as a visual screen along the eastern boundary line bordering your property and the Prater farm property. Either Virginia pines, eastern red cedars, or a mixture of the two species shall be planted immediately upon receipt of shoreline alterations approvals from the Corps and TVA. These trees will be a minimum of 1.5 to 2 inches in diameter at ground level when planted. These native, container-grown trees must be planted by you, the applicant, who guarantees survival and agrees to replant any tree that dies immediately or no later than the next planting season (November through January or within one year). Trees will be planted in two rows, 800 linear feet long, staggering or alternating rows along the buffer area designated in Figure 2 of the TVA correspondence dated 23 May 2008 in Appendix E. Each row will contain trees spaced 15 feet apart, and the rows would be placed 7 feet apart. Applicant will comply with the planting design shown in Appendix F. You must also identify and designate the affected lots on the final plat, as your commitment letter indicates, and submit a copy to the Corps and TVA. *Justification: To minimize visual impacts to properties eligible for listing on the National Register of Historic Places, pursuant to Section 106 of the Historic Preservation Act.*
  
7. To ensure that the proposed development would not adversely impact floodplains and flood control, the applicant must also adhere to the following conditions:
  - The 100-year flood elevation at this site is estimated to be elevation 816.5 msl. At a minimum, all the covered fixed docks shall be designed to prevent damage to moored or stored boats by forcing them against the roof during a 100-year flood event.
  - The floor elevation of the fixed docks will be a minimum of 2 feet above the normal summer pool elevation 813 msl.
  - For purposes of shoreline bank stabilization, all riprap must be placed, on average, no more than 2 feet from the existing shoreline at normal summer pool elevation 813 msl.
  - For all electrical services permitted, a disconnect switch shall be located at or above elevation 818.3 msl so that it is accessible during flooding.

*Justification: Floodplain Management executive order compliance.*

8. Structures - All color schemes for roofs and boat slip exteriors shall be visually compatible with natural background colors (dark green, gray, or brown hues). *Justification: Reduce aesthetic effects.*
9. Lighting - All lights used on the approved water use facilities shall be fully shielded or have internal low-glare optics, such that no light is emitted from the fixture at angles above the horizontal plane. Shielded low pressure sodium lamps shall be used during the construction and operational phases. Area lighting must be on poles no taller than 40 feet, unless they are lighting objects taller than 40 feet. In such cases, pole heights shall be minimized. *Justification: Reduce aesthetic effects.*
10. You will place signage at highly visible sites at both Community Docks A and B and at the ramp at Community Dock A encouraging users of these facilities to obey boating laws, observe safe boating practices, and act responsibly on the water. *Justification: Reduce boating risks and conflicts.*

## CHAPTER 6.0 List of Preparers

### Tennessee Valley Authority

#### Charles E. Bohac

Position: Specialist, Water Supply  
 Education: Ph.D., M.S., and B.S., Civil Engineering  
 Experience: 33 years in Water Resource Investigations, Water Quality Analysis, Waste Treatment and Disposal System Design, Groundwater Supply and Contamination Analysis, and Hydro and Fossil Power Plant Engineering  
 Involvement: Groundwater and Surface Water Resources and Water Supply

#### Patricia B. Cox

Position: Senior Botanist  
 Education: Ph.D., Botany (Plant Taxonomy and Anatomy); M.S. and B.S., Biology  
 Experience: 30 years in Plant Taxonomy at the Academic Level; 4 years with TVA Heritage Project  
 Involvement: Terrestrial Ecology, Invasive Plant Species, and Threatened and Endangered Species

#### Stanford E. Davis

Position: Senior NEPA Specialist  
 Education: B.S., Wildlife and Fisheries Science  
 Experience: 35 years in Wildlife Habitat and Land Management, Site Evaluation, and Environmental Impact Analysis and Review Requirements  
 Involvement: NEPA Compliance and Document Preparation

**Janet L. Duffey**

Position: Senior Watershed Representative  
Education: B.S., Civil Engineering  
Experience: 30 years in Land Management, River Operations, and Floodplain Management  
Involvement: Land use and Landrights

**James H. Eblen**

Position: Contract Economist  
Education: Ph.D., Economics; B.S., Business Administration  
Experience: 40 years in Economic Analysis and Research  
Involvement: Socioeconomics and Environmental Justice

**Jerry G. Fouse**

Position: Recreation Manager  
Education: M.B.A.; B.S., Forestry and Wildlife  
Experience: 34 years in Natural Resources – Recreation Planning and Economic Development  
Involvement: Recreation

**John M. Higgins**

Position: Water Quality Specialist  
Education: Ph.D., Environmental Engineering; B.S. and M.S., Civil Engineering; Registered Professional Engineer  
Experience: 35 years in Environmental Engineering and Water Resources Management  
Involvement: Surface Water and Wastewater

**Wesley K. James**

Position: Wildlife Biologist  
Education: B.S., Wildlife and Fisheries Science  
Experience: 32 years in Terrestrial and Wildlife Management and Environmental Impacts Evaluation  
Involvement: Terrestrial Ecology

**Clinton E. Jones**

Position: Senior Aquatic Community Ecologist  
Education: B.S., Wildlife and Fisheries Science  
Experience: 16 years in Environmental Consultation and Fisheries Management  
Involvement: Aquatic Ecology and Aquatic Threatened and Endangered Species

**M. Carolyn Koroa**

Position: Manager, Navigation & Water Supply Services  
Education: M.S. and B.A., Geography  
Experience: 18 years in Geographic Analysis; 10 years with TVA Navigation Program  
Involvement: Navigation Planning

**Roger A. Milstead**

Position: Program Manager, Flood Risk  
Education: B.S., Civil Engineering; Registered Professional Engineer  
Experience: 32 years in Floodplain and Environmental Evaluations  
Involvement: Floodplains

**Charles P. Nicholson**

Position: NEPA Policy Program Manager  
Education: Ph.D., Ecology and Evolutionary Biology; M.S., Wildlife Management; B.S., Wildlife and Fisheries Science  
Experience: 30 years in Zoology, Endangered Species Studies, and NEPA Compliance  
Involvement: NEPA Compliance

**W. Chett Peebles**

Position: Specialist, Landscape Architect  
Education: Bachelor of Landscape Architecture; Registered Landscape Architect  
Experience: 20 years in Site Planning and Visual Assessment  
Involvement: Visual Resources

**Marianne M. Shuler**

Position: Archaeologist Technician  
Education: B.A., Religion/Middle Eastern Archaeology  
Experience: 3 years in Middle Eastern Archaeology; 5 years in Southeastern U.S. Archaeology  
Involvement: Cultural Resources

**Cassandra L. Wylie**

Position: Atmospheric Analyst  
Education: M.S., Forestry and Statistics; B.S., Forestry  
Experience: 20 years in Atmospheric Modeling and Effects of Air Pollution on Forests; 8 years in Noise Analysis  
Involvement: Noise Impacts

**Nashville District, U.S. Army Corps of Engineers**

**Deborah T. Tuck**

Position: Regulatory Specialist  
Education: B.S. Biology; B.S. Recreation  
Experience: 15 years in Regulatory; 7 yrs in Natural Resources – Park Ranger  
Involvement: Regulatory Permitting

## CHAPTER 7.0 References

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