

4.0 ENVIRONMENTAL IMPACTS

4.1 Introduction

This chapter describes the environmental consequences on the TVA public land of Pickwick Reservoir potentially affected by the three alternatives. Under all three alternatives, previously unplanned land includes strips of retained land fronting TVA sale tracts. These retained strips of TVA public land that are encumbered with water access rights, have been allocated to Zone 7, Residential Access, in accordance with the SMI decision of 1999. Approximately 5.6 percent (1,085.43 acres) of TVA public land, which comprises 95.8 shoreline miles, on Pickwick Reservoir is proposed for allocation to Zone 7, Residential Access. As explained in Section 1.3 in this EIS, land in the Residential Access Zone has been categorized as shoreline protection, residential mitigation, and managed residential under the TVA SMP. Review of private water use facility requests in Zone 7 would include consideration of the site's shoreline categorization status to ensure that environmental impacts would be negligible. Protective measures presently in place under TVA's land use approval process and SMI (TVA, 1998a) would reduce or minimize impacts of residential development of private property.

Under the No Action Alternative, the land use allocation categories assigned to each parcel in the 1981 Plan would remain in effect. Under the Action Alternatives B and C, TVA would update the allocations originally designated for each parcel in the 1981 Plan to reflect the land use zones defined in Table 2-1 of this EIS. Action Alternatives B and C incorporate alternative land use zone allocations for three parcels.

4.2 Terrestrial Ecology (Plant and Animal Communities)

Alternative A

Historically, TVA resource management activities have been planned and implemented as a means of demonstrating environmentally acceptable and cost-effective strategies for managing publicly owned natural resources. The majority of these activities have occurred on mainstem TVA reservoirs, with Board-approved Plans that were prepared based on technical data and public input. The long-term allocation of land for natural resource management under the wildlife and forest management categories has allowed TVA to invest time and money to maintain and enhance biological diversity, protect sensitive wildlife species, and provide public use and enjoyment of the terrestrial environment of this land.

Under the No Action Alternative, forested areas on TVA public land would remain forested and continue to mature, with forest wildlife species remaining relatively stable at current levels. As old fields and shrub areas continue to revert to forests, there will be a decrease in wildlife species dependent on these habitat types and an increase in forest wildlife species. TVA public land licensed for agricultural purposes and the wildlife species using them would likely remain unchanged, while areas managed for public access (i.e., dam reservations) can increase or decrease with TVA budget fluctuations. Any major changes in use patterns under the 1981 Plan could create a corresponding change in vegetation and wildlife utilizing the affected parcels of land. However, these types of impacts would be localized and negligible on a regional or subregional basis.

Impacts to botanical components of terrestrial ecological resources are anticipated to be insignificant on Parcels 37, 53, and 156, because no sensitive or otherwise uncommon plant communities occur on these parcels.

Under the No Action Alternative, Parcel 128 would remain allocated to the following land use categories as originally designated in the 1981 Plan: General Forest Management, Minor Commercial Landing, Access for Future Development, and a Safety Harbor. The uncommon plant community (open cliff face dominated by alumroot) present on Parcel 128 could be adversely impacted by future development. As stated in Section 2.1, if Alternative A were adopted, future proposed actions on any parcel would be evaluated for their potential environmental impacts on a case-by-case basis using existing environmental review procedures. Provided that potential impacts are identified and the appropriate avoidance and/or mitigation measures successfully implemented, impacts to this uncommon plant community are anticipated to be insignificant under the No Action Alternative. Parcels 16, 32, 44, and 148 were examined during field surveys because of the known presence of wildlife resources. Under the current allocation for natural conservation uses, the terrestrial resources on these four parcels would continue to be protected and would not be affected.

Under Alternative A, 6,060 up to 10,585 acres (31.5 to 55.0 percent) could be managed for conservation uses, and would result in insignificant cumulative impacts to the terrestrial ecology of Pickwick Reservoir.

Alternatives B and C

Under Alternatives B and C, approximately 85 percent of TVA public land on Pickwick Reservoir would be allocated to three land use zones: Zone 2, Project Operations; Zone 3, Sensitive Resource Management; and Zone 4, Natural Resource Conservation. Approximately 145 additional acres would be allocated to Zones 3 and 4 under Alternative C than under Alternative B. The following types of activities could occur on parcels allocated to Zones 3 and 4:

- Vegetation management including forest management to improve the diversity of tree species and sizes, to encourage growth and maturation of fruit and nut-producing trees, to develop wildlife openings, and to protect snags and wildlife-nesting cavities.
- Open land management to provide a diversity of vegetation ranging from planted, warm-season, native grasses to old fields and shrub edges.
- Wetland management to protect and/or enhance the hydrology, soils, and vegetation, as well as to improve overall functions and values.
- Riparian management to allow the development of native vegetation or restoration of riparian vegetation through soil bioengineering.

It is expected that these activities could occur without negative terrestrial or aquatic ecological effects if the size of vegetation management areas were limited, sensitive resources and features were avoided, and appropriate soil erosion controls were implemented. TVA received several comments during scoping that expressed concern for the preservation of natural resources (e.g., natural areas, wildlife habitat, wetlands) and the ways in which these resources may be compromised by increased development (e.g., loss of sensitive habitat, clear-cutting of land along the shoreline). At this time, no

timber harvests are proposed on TVA public land surrounding Pickwick Reservoir. TVA's management of forest resources is the result of stakeholder needs, comments, and issues balanced in Natural Resource Unit Management Plans. When the need arises, timber harvesting may be considered to address stakeholder requests, impacts from insect infestation and storms, safety issues, etc. These actions would incorporate the appropriate level of environmental review.

Ten percent of TVA public land on Pickwick Reservoir is proposed for allocation to Zone 5, Industrial/Commercial Development, and Zone 6, Developed Recreation. Under Alternatives B or C, parcels allocated for Zone 6, Developed Recreation, have recreation facilities present, with the exception of Parcel 37. Any activities proposed in the future would be reviewed for potential impacts to terrestrial resources.

The general mix of TVA forest land and open land in the counties surrounding Pickwick Reservoir is expected to remain relatively unchanged in the near future. Privately-owned forests and open land are, however, likely to be subject to increased development pressure. By maintaining more than 85 percent of TVA public land in forested and open-land parcels, implementation of Alternatives B or C could offset some cumulative effects of development and fragmentation on nearby private land. Because of the relatively small acreage of TVA public land surrounding the reservoir, the choices for management of TVA public land would be unlikely to influence regional trends in forest fragmentation, and any temporary negative natural resource management impacts would be negligible on a regional basis. Selection of Alternative B would have a beneficial effect on the terrestrial ecology on TVA public land and in the region. The greatest benefit would occur from selection of Alternative C, because almost 145 more acres are allocated to Zones 3 and 4.

Under Alternatives B and C, Parcels 16, 32, 42, and 148 would be allocated to Zone 4, Natural Resource Conservation. Parcel 128 would be allocated to Zone 3, Sensitive Resource Management. Therefore, the biological resources on these parcels would continue to be protected and would not be affected. For these parcels, impacts to terrestrial ecological resources under these alternatives would be beneficial because of the protection to the terrestrial resources.

Under Alternative B, 13,430 acres (69.8 percent) are allocated to Zones 3 and 4, and there would be insignificant cumulative impacts to the terrestrial ecology of Pickwick Reservoir. Under Alternative B, Parcel 37 would be allocated to Zone 6, Developed Recreation. This would modify much of the existing wildlife habitat along this parcel. Because of the extensive amount of exotic plants, this parcel does not provide high quality wildlife habitat; therefore, this allocation change is not expected to result in significant impacts to the terrestrial ecology on this portion of the reservoir. Parcel 53 would be changed from general forest management to Zone 5, Industrial/Commercial Development. Industries located in the Barton Industrial Park would likely request water access facilities across this parcel. This parcel contains excellent wildlife habitat, and industrial development could result in adverse impacts to the terrestrial ecology on this portion of the reservoir. These impacts could be minimized by only allowing water intake or discharge structures in a single corridor and maintaining most of the parcel in a forested state to provide a buffer between the back-lying industrial park and Pickwick Reservoir.

Under Alternatives B and C, Parcel 128 would be allocated to Zone 3, Sensitive Resource Management, and designated as a TVA Natural Area. Because this would provide increased protection to the uncommon plant community found on this parcel, Alternatives B and C would be slightly beneficial to the terrestrial ecology of the region.

Alternative C, which allocates 13,571 acres (70.5 percent) to Zones 3 and 4, would have the most beneficial impacts to the terrestrial ecology of Pickwick Reservoir since this alternative considers the most acreage for allocation to these zones. Under Alternative C, Parcels 37 and 53 would be allocated to Zone 4, Natural Resource Conservation. Parcel 128 would be allocated to Zone 3, Sensitive Resource Management.

4.3 Sensitive (Endangered and Threatened) Species

4.3.1 Terrestrial Plants and Animals

Impacts to sensitive plant species associated with each of the three alternatives are discussed below. Under all the alternatives, no impacts to protected plant species on Parcels 37, 53, and 156 are anticipated because none are known or expected to occur on these parcels. Populations of federal-endangered gray bats are inventoried annually on Pickwick Reservoir by state and federal biologists. Population levels remain stable and in some cases have increased throughout Pickwick Reservoir. Also, because colonies of gray bats are sensitive to human disturbance, protective buffers have been placed around caves on Pickwick Reservoir land that are known to be used by gray bats. Reduction of erosion and siltation by maintaining riparian vegetation would benefit populations of gray bats. Because caves are extremely fragile and biologically significant, TVA has placed protective buffer zones around each of the known caves on TVA public land.

Adult and juvenile bald eagles were observed on Parcel 16. This large wetland complex provides suitable nesting habitat for bald eagles as well as habitat for other federal and state-listed species. This parcel would be allocated to Zone 4, Natural Resource Conservation, under Alternatives B and C and remain allocated for wildlife and forest management under Alternative A. Additional parcels on Pickwick Reservoir provide suitable habitat for several protected or uncommon species of terrestrial animals.

Alternative A

Under the 1981 Plan (Alternative A), land was allocated to wildlife management and natural areas to protect sensitive terrestrial animal species, sensitive ecological areas, or specialized habitats identified on land parcels. Additionally, existing environmental review procedures, including compliance with the Endangered Species Act (ESA), assure that TVA actions would not likely adversely affect the habitat of rare species. However, there is some potential for fragmentation of the resource due to case-by-case land use actions and permitting, which, when given the dynamic characteristics of most animals, could result in cumulative loss of habitat over time. Thus, while TVA would protect sensitive species during individual reviews, there is some potential for indirect or cumulative impacts under the No Action Alternative. Protected or uncommon terrestrial animal species would not be affected because most parcels with suitable habitat for these species are allocated for natural conservation uses.

No impacts are anticipated to sensitive plant species on Parcels 37, 53, and 156 under Alternative A, because these species are not known or expected to occur on these parcels. Impacts to sensitive plant species are unknown on Parcel 26, because this parcel was not surveyed for the presence of such species during the preparation of this EIS. However, as part of the NPS, it is expected that sensitive resources would be protected on this parcel.

Under the No Action Alternative, Parcel 128 would remain allocated to the following land use categories as originally designated in the 1981 Plan: General Forest Management, Minor Commercial Landing, Access for Future Development, and a Safety Harbor. The sensitive plant species present on Parcel 128 could be adversely impacted by future development. As stated in Section 2.1, if Alternative A were adopted, future proposed actions on this parcel would be evaluated for their potential environmental impacts on a case-by-case basis using existing environmental review procedures. Provided that potential impacts are identified, and the appropriate avoidance and/or mitigation measures successfully implemented, any impacts to sensitive plant species present on Parcel 128 are anticipated to be insignificant under the No Action Alternative.

Alternatives B and C

Under these alternatives, Parcel 16 would be allocated to Zone 4, Natural Resource Conservation. Comments received during public scoping requested more protection of the natural resources on this parcel. Designation of this parcel to Zone 4 would be suitable for the management of fringe wetlands and the possibility for bald eagle nesting. Potential habitat for protected animal species has been identified on Parcel 128. This habitat is considered to be of excellent quality. Under Alternatives B and C, Parcel 128 would be allocated to Zone 3, Sensitive Resource Management and designated as an HPA within the system of the TVA Natural Areas. This would protect potential suitable habitat for a variety of state-listed amphibians and potential habitat for federal-protected bald eagles and Indiana bats in the Yellow Creek embayment. Because this would provide increased protection to the sensitive plant species found on this parcel, Alternatives B and C would be beneficial to this resource.

Under Alternative B, Parcel 53 would be allocated to Zone 5, Commercial/Industrial Development. This could result in the loss or severe modification of suitable nesting habitat for bald eagles. This loss of habitat is not likely to have an adverse effect considering the large amounts of suitable bald eagle habitat on this portion of the reservoir. Impacts could be minimized by only allowing water intake or discharge structures in a single corridor along the edge of the parcel and maintaining most of this forested parcel to provide a buffer between the back-lying industrial park and Pickwick Reservoir. Under Alternative C, Parcel 53 would be allocated to Zone 4, Natural Resource Conservation.

In conclusion, adoption of the proposed Plan alternatives would not adversely affect populations of threatened and endangered terrestrial plants and animals in the region. Adoption of Alternative A would result in insignificant cumulative impacts to protected species on Pickwick Reservoir.

4.3.2 Aquatic Animals

Alternative A

In the present plan, many sections in Parcel 32 are adjacent to areas which contain habitat for most of the sensitive aquatic animals discussed in Section 3.3.2. Most of the allocation categories given to these parcels (wetland wildlife, upland wildlife, waterfowl wildlife, archeology, special management area, including a mussel sanctuary and TVA HPA) are adequate to protect these sensitive aquatic animal species or their specialized habitats. Parcels allocated for general forest research or agriculture and the previously unplanned marginal strip have a lesser degree of protection for these resources. Existing environmental review procedures on these parcels including compliance with the ESA, would assure that TVA actions would not likely adversely affect the habitat of protected aquatic species in adjacent areas. While TVA would protect sensitive species during individual reviews, there is some potential for indirect or cumulative impacts under this No Action Alternative.

Alternatives B and C

Under both of these alternatives, Parcel 32 would be allocated to Zone 4, Natural Resource Conservation, consistent with the Plan Revision Process (see Section 2.2.1) because it is under an existing agreement with ADCNR for management as a WMA. Parcel 31, the entrance to Key Cave, would be allocated to Zone 3, Sensitive Resource Management, because of the sensitive resources identified and the parcel's consideration for addition to the Key Cave National Wildlife Refuge.

The cumulative effects of these actions could result in improved riparian buffer zones, and may help improve water quality and aquatic habitats downstream of the project areas, including the areas where sensitive aquatic species are known to occur.

Parcel 47 is allocated for industrial use under both Alternatives B and C, and the sensitive aquatic resources present near this parcel would receive the same level of protection as they would under the current allocations under Alternative A.

4.4 Managed Areas and Sensitive Ecological Sites

Field surveys were conducted in July 2001. The purpose of the surveys was to evaluate the parcels for their scenic and aesthetic qualities, ecological significance, and suitability for designation as TVA Natural Areas. TVA Natural Areas include SWAs, Ecological Study Areas, HPAs, and Wildlife Observation Areas. Parcel 128 was found to contain resources that would benefit from designation as a TVA Natural Area under the HPA category. The remaining parcels were not found suitable, and, therefore, environmental consequences under any of the three alternatives would be insignificant from a Natural Areas perspective.

No Action Alternative

Under the No Action Alternative, use of TVA public land on Pickwick Reservoir would continue to be based on the 1981 Plan. Under this system, impacts to Natural Areas and Ecologically Significant Sites would be assessed during site-specific reviews. Each proposed land use would be reviewed, and the impacts to significant natural features

from such use would be evaluated. However, additional Natural Area designations would not be proposed.

Alternatives B and C

Under Alternatives B and C, Natural Areas are included in Zone 3, Sensitive Resource Management, or Zone 4, Natural Resource Conservation. Parcel 126, Cooper Falls TVA HPA is allocated to Zone 3, Sensitive Resource Management. Parcel 32, Coffee Bluff TVA HPA is allocated to Zone 4, Natural Resource Conservation. Parcels 121, 125, 129, and 134, include Sandstone Outcrops/Pickwick Lake Protection Planning Site and are allocated to Zones 3, Sensitive Resource Management, and 4, Natural Resource Conservation. Parcel 117, which includes the Eastport Bluffs, is allocated to Zone 3, Sensitive Resource Management. Parcel 31, Alabama Cave Fish Designated Critical Habitat (Key Cave) is allocated to Zone 3, Sensitive Resource Management.

During the field surveys, Parcel 128 contained significant communities of rare plants and animals, and, therefore, has been allocated to Zone 3, Sensitive Resource Management, under Alternatives B and C. These species and their habitats are described in section 3.3. Impacts as a result of this allocation would be beneficial because of the protection provided to the rare plants and uncommon plant community found here.

Under Alternatives B and C, the TVA environmental review process would continue to be used to address potential impacts of actions on TVA public land to sensitive resources. These alternatives provide enhanced protection of significant natural features, rare plants, and rare animals through the allocation of land to Zone 3, Sensitive Resource Management, and Zone 4, Natural Resource Conservation. By identifying significant Natural Areas and protecting them from development, selection of either of these alternatives would have a beneficial effect on the preservation of Ecologically Significant Sites on TVA public land and in the region. In addition, these alternatives address public requests for greater protection of endangered species, natural land, and land with unique features by protecting such areas as TVA HPAs. In addition, there would be increased opportunities for wildlife observation, wildlife management, and conservation zones. As indicated by public responses through questionnaires and public meetings, managing more TVA public land under Sensitive Resource Management and Natural Resource Conservation zones would address TVA public land use preferences. Any proposed action under either Alternative B or C would be subject to the environmental review process. At that time, compatibility of the proposed action and management objectives for any subject TVA Natural Areas land would be evaluated. Alternative C would protect the most TVA public land in a natural state.

4.5 Water Quality

Under all three alternatives, residential shoreline development on private property would likely increase. Additional development from Zone 7, Residential Access, would have potential to result in increased runoff from agricultural/lawn chemicals and in increased sewage/septic loadings. Negative potential impacts to water quality associated with residential development activities may include increased turbidity, increased levels of substances toxic to aquatic life, increased bacteriological concentrations, and a further increase in nutrient loading. Protective measures presently in place under TVA's land

use approval process and SMI (TVA, 1998a) would substantially offset impacts of residential development of private property.

Activities in Zone 2, Project Operations, have the potential to affect water quality under all three alternatives, also. Most Zone 2 land is used for the Pickwick Landing Dam Reservation, Colbert Fossil Plant Reservation, and various local utility water intakes and facilities. Runoff impacts can likely be minimized by the use of vegetative buffers and runoff control measures.

Alternative A

Under Alternative A, the extent to which a proposed land use might affect water quality depends on the nature and extent of development. Proposed land uses under the 1981 Plan are somewhat less restrictive than the proposed new zones. Future industrial/commercial and recreational developments have the potential to result in some degree of increased soil erosion due to clearing of woody vegetation and brush, increased runoff of agricultural/lawn chemicals, or increased sewage/septic loadings. Negative impacts to water quality associated with these activities may potentially include an increase in the levels of chemicals and substances toxic to aquatic life, an increase in turbidity, an increase in bacteriological concentrations, and further increases in nutrient loading. Under the No Action Alternative, any proposed use of TVA public land would be evaluated on a case-by-case basis to ensure it fits the allocated use and that the proposed use best serves the needs and/or interests of the public.

Alternatives B and C

Under Alternatives B and C, a better opportunity to protect water quality is provided by allocating some parcels that had a more general land use (such as open space or natural areas) in the 1981 Plan to Zone 3, Sensitive Resource Management, and Zone 4, Natural Resource Conservation. Activities in Zones 3 and 4 also have the potential to affect water quality, although to a lesser extent. Forest and wildlife management activities, and agricultural uses would be allowed with rigorous implementation of BMPs to control soil erosion and with designated streamside buffers. Environmental reviews for any proposed use of land would require the protection of water quality either through restricted development or the assurance to use BMPs that would minimize negative impacts. Also, the public's desire for increased protection of natural resources and water quality is incorporated.

In comparing Alternatives B and C, allocations for only three parcels are different (Parcels 37, 53, and 156). Under Alternative B, Parcel 37 would be allocated to Zone 6, Developed Recreation. This could modify much of the existing riparian vegetation along this parcel and would increase impervious surfaces along the Florence Canal. Parcel 53 would be allocated to Zone 5, Industrial/Commercial Development. These type of developments would lead to extensive impervious surfaces throughout the back-lying properties (paved trail, parking lots, etc.). Increased imperviousness contributes to increased runoff during rain events. Runoff, especially from parking lots and industrial sites can often contain high levels of nutrients (nitrates). Lack of proper filtration systems, as well as increased volumes of runoff, allows large volumes of contaminants to enter the reservoir. Other contaminants, such as oils, grease, antifreeze, etc., would also be present in runoff from these surfaces and could contribute to a decline in water quality in the reservoir. Runoff impacts can likely be minimized by the use of vegetative buffers and runoff control measures. Under Alternative B, Parcel 156 would be

allocated to Zone 7, Residential Access. Requests for the alteration or further development of this parcel would need to include BMPs and maintenance of a 50-foot SMZ to reduce potential impacts. Insignificant impacts as a result of these allocations are anticipated because these parcels are already developed for these land uses.

Under Alternative C, Parcels 37 and 53 would be allocated Zone 4, Natural Resource Conservation. This allocation would best protect the overall water quality in the reservoir by providing a filter (riparian buffer) for the runoff of back-lying properties. Parcel 156 would also be allocated to Zone 4, Natural Resource Conservation. However, because residential development already exists on this parcel, the potential impacts would be similar to Alternative B. Allocation to Zone 4 could allow more potential to enhance the riparian buffer fronting these lots, reducing any potential for nutrient loading from lawn maintenance activities.

4.6 Aquatic Ecology

Under all three alternatives, future development in the marginal strip, could lead to additional lawn and septic system runoff and riparian buffer loss. These problems could further exacerbate the trend of increasing nutrient loading and chlorophyll levels in lower Pickwick. These impacts were assessed in SMI (TVA, 1998a). Protection of the riparian buffer under this initiative would help protect the reservoir from additional nutrient runoff from such developments, thus providing a more stable habitat for the aquatic communities.

Alternative A

Under Alternative A, proposed land uses under the 1981 Plan are somewhat less restrictive than the proposed new zones. Activities associated with future industrial/commercial and recreational developments have the potential to result in increased negative impacts to aquatic ecology. These activities may potentially include an increase in the levels of chemicals and substances toxic to aquatic life, an increase in turbidity, an increase in bacteriological concentrations, and further increases in nutrient loading. Under the No Action Alternative, any proposed use of TVA public land would be evaluated on a case-by-case basis to ensure it fits the allocated use and that the proposed use best serves the needs and/or interests of the public.

Alternatives B and C

Alternatives B and C would provide an opportunity to protect and enhance aquatic habitats by allocating the majority of TVA public land (69.8 to 70.5 percent) to Zone 3, Sensitive Resource Management, or Zone 4, Natural Resource Conservation. Under the 1981 Plan, these habitats have less specific, multiple allocated uses, and allow the protection or enhancement of aquatic habitats through the preservation of existing natural shorelines, which offers a variety of cover types. The extent of woody shoreline cover on parcels allocated to Zones 3, Sensitive Resource Management, and 4, Natural Resource Conservation, is expected to increase in the future as natural succession continues. This woody shoreline cover is important to the littoral zone because it provides shade to cool the water temperature and provides woody debris for benthic organisms. The littoral zone is the most productive habitat of a reservoir environment. Fish utilize littoral habitats because of their spawning requirements, the availability of submerged cover (i.e., rocks, logs, brush, etc.), and the presence of smaller fish and aquatic invertebrates as a food source for the fingerlings.

Forest, agricultural, and wildlife management activities in Zones 3 or 4 could potentially affect aquatic ecology through runoff of nutrients and soils. These potential impacts would be avoided through careful planning and mitigation to limit the sizes of activities and use of rigorous BMPs during implementation.

Allocation of TVA public land to Zone 6, Developed Recreation, would allow locations for public access for bank fishing, as well as the construction of fishing piers, artificial fish attractors, and other fish habitat enhancements. Approval requirements for proposed developments, such as public parks, recreation areas, and water-access sites, in addition to permitting greater opportunity for public use, would require protection of important natural features. The quality of shoreline aquatic habitats would improve with the protective zones mentioned above, through the enhanced opportunity for natural succession, as well as protective vegetation management now required through TVA's SMP standards for private water use facilities.

TVA public land fronting Zone 5, Industrial/Commercial Development, can be maintained in a natural condition, since industrial/commercial development seldom requires extensive clearing of shoreline vegetation. Some negative aquatic habitat impacts would occur under either alternative but can be kept to an insignificant level with proper planning and by requiring protective measures during land use approvals. TVA has rated the aquatic habitat on Pickwick Reservoir "good" overall. In order to maintain this rating, impacts to near shoreline aquatic habitats would continue to be considered in the proposed use of TVA public land under either alternative.

Under Alternative B, Parcel 53 would be allocated to Zone 5, Industrial/Commercial Development. This type of development could lead to extensive soil-disturbing activities and resulting erosion and sedimentation of receiving waters unless strict erosion control measures are installed and maintained before any construction activities began. In addition, extensive impervious surfaces throughout the back-lying properties contribute to increased runoff during rain events. Runoff, especially from parking lots and industrial sites, can often contain high levels of nutrients (nitrates). Lack of proper filtration systems, as well as increased volumes of runoff, allows large volumes of contaminants to enter the reservoir. Other contaminants, such as oils, grease, antifreeze, etc., could also be present in runoff from these surfaces and would result in greater impact to the aquatic communities in the reservoir. These impacts could be rendered insignificant with proper containment and filtration of runoff waters from industrial development and use of BMPs during construction activities. Cumulative impacts resulting from industrial/commercial development under Alternative B, in addition to existing development on the reservoir could degrade the aquatic communities of the reservoir unless strict runoff filtration measures are implemented to prevent these impacts.

Under Alternative C, Parcel 53 would be allocated to Zone 4, Natural Resource Conservation. This allocation would best protect the aquatic community in this section of the reservoir by providing a filter (riparian buffer) for the runoff of back-lying properties.

4.7 Wetlands and Floodplains

4.7.1 Wetlands

All of the wetlands, whether they were determined to be functionally significant or not, would be protected from most direct impacts through compliance with federal mandates and legal requirements for protection of wetlands. Regulatory protection is extended to wetlands under Section 404 of the Clean Water Act, and TVA is subject to EO 11990, Protection of Wetlands, which mandates that federal agencies take such actions as may be necessary to “minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands...” Consistent with this requirement, TVA would, to the extent practicable, take measures to either avoid adverse impacts to wetlands or mitigate unavoidable effects to wetlands in decisions relating to transactions of land rights or during its Section 26a review of water use facilities.

Under all three alternatives, wetlands present in the marginal strips (Zone 7 for Alternatives B and C) would be protected under federal law, and any potential impacts to wetlands would be regulated under these programs. In site-specific cases where some wetland impacts do occur, mitigation requirements would offset any long-term loss of wetland functions. However, there would be some short-term loss of wetland functions during the time required for the mitigated wetland to mature. There may also be some incremental clearing of wetland vegetation by landowners resulting in some minor, cumulative loss of wetland function, primarily shoreline stabilization, wildlife habitat provision, and plant community diversity.

Alternative A - No Action Alternative

Under the No Action Alternative, TVA would continue to use the 1981 Plan to guide decision making regarding land use on TVA public land surrounding Pickwick Reservoir. Land use requests for parcels containing wetlands and allocated for wetland wildlife management, waterfowl management, and HPAs would be evaluated to ensure the proposed request would protect the integrity of wetland resources.

Alternative B

Under this alternative, Parcel 37 would change from a current allocation of Barge Terminal/Industrial Site to Zone 6, Developed Recreation, which could protect small areas of forested wetland and would ultimately be beneficial. For Parcel 53, a change from the current allocation of Upland Wildlife/General Forest Management to Zone 5, Commercial/Industrial Development, could result in the loss of emergent and forested wetlands present on the site.

There could be wetland impacts/loss associated with changing the land use allocation for Parcel 53. Total acreage loss could be relatively small (<5 acres). Wetland impacts to this parcel would be mitigated by setting aside these areas for protection, including small upland buffers. However, there may be a loss of some wildlife habitat function, due to human encroachment and disturbance. There may also be contamination of the wetlands from upland industrial/commercial runoff, further diminishing their overall ecological health. This incremental loss may not be individually significant, but together

with the cumulative loss and alteration of wetlands in the general project area, they would add minimally to a cumulative loss of wetland function.

Alternative C

Under Alternative C, Parcel 37 would be allocated to Zone 4, Natural Resource Conservation. This parcel does contain a small area of forested wetland, and would be protected under the Zone 4 allocation. For Parcel 53, a change in allocation from Upland Wildlife/General Forest Management to Zone 4, Natural Resource Conservation, would protect the wetlands on this parcel. There may also be contamination of the wetlands from upland industrial/commercial runoff, diminishing their overall ecological health. This incremental loss may not be individually significant, but, together with the cumulative loss and alteration of wetlands in the general project area, it would minimally add to an overall cumulative loss of wetland function.

4.7.2 Floodplains

Any development proposed in the 100-year floodplain is subject to the requirements of EO 11988 (Floodplain Management). The first step is to determine if the activity is covered under TVA's "Class Review of Certain Repetitive Actions in the 100-Year Floodplain" (TVA, 1981b). As a result of this review, TVA has already determined that there were no practicable alternatives to several actions that would avoid siting in the floodplain. A set of review criteria was also established to ensure that natural and beneficial floodplain values are not significantly affected by the repetitive actions. If these criteria are followed, adverse floodplain impacts would be minimized.

If an activity is not a repetitive action in the 100-year floodplain, EO 11988 requires the applicant and the initiating TVA organization to evaluate alternatives to the floodplain siting which would either identify a better option or support and document a determination of "no practicable alternative" to siting within the 100-year floodplain. Land in Zone 2 is virtually all above the 100-year flood elevation for Pickwick Reservoir. Some of the land being allocated to Zones 6, Developed Recreation, and 7, Residential Access, is within the 100-year floodplain. However, there is no practicable alternative to making such allocations. The small acreage in Zone 6 that is within the floodplain is contiguous with the existing recreation areas on upland sites; likewise, land in Zone 7, Residential Access, is by definition on the shoreline providing access to the water. Further, development that could impact land in the 100-year floodplain would include measures to minimize impacts to the floodplain. Such measures could include location of the project above the flood elevation, flood proofing the project, constructing and designing the project to make structures withstand flood damage, or other appropriate measures.

Under any of the alternatives, any development proposed in the 100-year floodplain would be subject to the requirements of EO 11988 when TVA proposes to approve requests for the development. Case-by-case evaluations would verify compliance with EO 11988. Potential development would generally consist of water use facilities and other repetitive actions in the floodplain that should result in minor floodplain impacts. Alternative A would likely have greater potential for adverse impacts to natural and beneficial floodplain values than Alternative B or C because less land is allocated for resource management and conservation activities in the 1981 Plan. On a comparative basis, Alternatives B and C would have far less impacts on floodplains since a substantial portion of the TVA public land (69.8 to 71.4 percent) would be allocated to

Zones 3 and 4 in which there would be no development. Under any of the alternatives, any anticipated and cumulative impacts to floodplain values would be insignificant.

4.8 Land Use and Prime Farmland

4.8.1 Land Use

Under Alternatives B and C, TVA has proposed allocations that are compatible with the local zoning ordinances of the cities of Florence, Muscle Shoals, Sheffield, and Waterloo on properties that are adjoining TVA public land and are within city limits. Proposed new development would result in changes to the original land plan. The acreage of land use change resulting under each alternative is listed in Table 2-5. Parcels that would result in land use changes under Alternatives B and C are listed in Tables 2-3 and 2-4.

Potential Industrial/Commercial Development for Pickwick Reservoir could consist of fleeting areas, ports, an industrial park, industrial access, barge terminal sites, and minor commercial landings. Under Alternative A, requests on a total of 2,499.63 acres could be considered for Zone 5, Industrial/Commercial Development, on a case-by-case basis. Under Alternatives B and C, the amount of land to be allocated to Zone 5, Industrial/Commercial Development, would decrease to 534.45 and 450.34 acres, respectively.

Under all alternatives, allocations would be made so that current recreation use would continue. For a more detailed discussion, refer to Section 4.12 on recreation.

During public scoping, members of the general public expressed concern over the increased amount of boat traffic. The comments collected were in direct relation with the heavy residential development on the lower end of the reservoir. Areas that are allocated to Zone 7, Residential Access (areas with existing deeded access rights), will continue to be able to apply for a permit for water use facilities. Under all alternatives, no new residential access will be allocated thus not contributing to recreational boat crowding on busy weekends.

4.8.2 Prime Farmland

Alternative A

To determine impacts to farmland, parcels with the potential to be converted to nonagricultural land use must be evaluated. Parcels allocated to Zones 5, 6, or 7 have this potential. Allocations to Zones 3 and 4 would protect farmland from development. Under Alternative A, 6,060 up to 10,585 acres could be allocated to Zones 3 and 4 (see Table 2-5) compared to 13,435.8 acres under Alternative B, and 13,727 acres under Alternative C. There are a total of 259.13 acres that were previously unplanned and 1,070.99 acres on which requests for private water use facilities could be considered because of existing water access rights. In the 1981 Plan (Alternative A), many of the parcels were designated for multiple uses. Many included allocations for future development access. Because of this potential for future development under Alternative A, the farmland on 4,067.9 acres could potentially be converted. The effects of prime farmland were not considered in the 1981 Plan because the FPPA was not created until 1981. Future land use requests for parcels under the 1981 Plan would be evaluated to ensure the proposed request would comply with the FPPA.

Alternative B

For comparison of the impacts of implementing Action Alternative B or C, the parcels allocated for new development, Zones 5, 6, and 7, were evaluated. Only ten parcels meet this criteria for Alternative B. These are Parcels 21, 43, 53, 61, 63, 94, 98, 102, 105, and 118. None are located in Hardin County. Soils which occur in these parcels are listed in Table 4.8-1. The most frequently occurring soil classified as prime farmland is the associated Pruitton-Dullivan silt loam located on slopes from 0 to 2 percent. These soils occupy 57.35 acres of the Colbert County parcels. These very deep, well-drained, nearly level soils are well suited to row crops of cotton, corn, and soybeans, and to grasses and legumes for hay and pasture.

Acreage of prime farmland for each of the parcels allocated for new development by this alternative is listed in Table 4.8-2. A total of 84.84 acres have the potential to be converted. The “Farmland Conversion Impact Rating” was completed with assistance from Bobby Fox, Resource Soil Scientist, of the NRCS-USDA as required by the FPPA (Appendix E). If the total rating exceeds the 160-score threshold, then the FPPA suggests that another site be selected. For the parcels in Colbert County, a relative farmland rating of 90 was assigned, the site assessment score is 58, for a total rating of 148. For the parcel in Lauderdale County, the relative farmland rating assigned is 83, the site assessment rating is 47, for a total score of 130. Both these ratings are below the 160 threshold. The parcel located in Tishomingo County did not contain prime farmland soils. The impact of converting the farmland in these parcels would be insignificant.

Table 4.8-1. Soils Occurring on Parcels With Potential for New Development				
County	Parcel No.	Soil Symbol	Soil Description *Prime Farmland	Total Acres
Colbert ¹	43	FbF	Fullerton-Bodine complex, 15-45% slope	3.74
		PUA	*Pruitton and Dullivan silt loams, 0-2% slope	33.11
	53	FaD	Fullerton cherty silt loam, 6-15% slope	14.41
		FbF	Fullerton-Bodine complex, 15-45% slope	46.19
		DaB	*Decatur silt loam, 2-16% slope	13.66
		FaB	*Fullerton cherty silt loam, 2-6% slope	8.46
		PUA	*Pruitton and Dullivan silt loams, 0-2% slope	5.87
	61	FaD	Fullerton cherty silt loam, 6-15% slope	1.54
		FbF	Fullerton-Bodine complex, 15- 45% slope	5.72
		SaF	Saffell-Pikeville complex, 15-45% slope	14.03
	63	SaF	Saffell-Pikeville complex, 15-45% slope	25.18
	94	CbA	*Chenneby silt loam, 0-2% slope	3.41
	98	CnF	Chisca-Nella-Nectar complex, 10-45% slope	3.77
		EtB	*Etowah silt loam, 2-6% slope	1.54
		PUA	*Pruitton and Dullivan silt loams, 0-2% slope	3.09

Table 4.8-1 (cont.). Soils Occurring on Parcels With Potential for New Development				
County	Parcel No.	Soil Symbol	Soil Description *Prime Farmland	Total Acres
	102	ChD	Chisca loam, 6-15% slope	0.57
		CnF	Chisca-Nella-Nectar complex, 10-45% slope	3.27
		PUA	*Pruittton and Dullivan silt loams, 0-2% slope	9.46
	105	CnF	Chisca-Nella-Nectar complex, 10-45% slope	1.57
		ShB	Savannah loam, 1-5% slope	0.22
		PUA	*Pruittton and Dullivan silt loams, 0-2% slope	5.82
Lauderdale ²	21	BoE	Bodine cherty silt loam, 10-35% slope	0.29
		Le	Lee cherty silt loam, level	7.57
		SBF	Saffell and Bodine soils, steep	2.07
		DoA	*Dickson silt loam, 0-2% slope	0.29
		EtB	*Etowah silt loam, 2-8% slope	0.15
Tishomingo ³	118	SA	Saffell-Smithdale association, hilly	17.91

¹USDA – Soil Conservation Survey (SCS), Soil Survey of Colbert County, Alabama, 1994

²USDA – SCS, Soil Survey of Lauderdale County, Alabama, 1977

³USDA – SCS, Soil Survey of Tishomingo County, Mississippi, 1983

Table 4.8-2. Prime Farmland Allocated to Zones 5 or 7 for Alternative B				
County	Parcel No.	Zone	Total Acres	Prime Farmland Acres
Colbert ¹	43	7	36.85	33.11
	53	5	88.59	27.98
	61	7	21.29	0.0
	63	7	25.18	0.0
	94	7	3.41	3.41
	98	7	8.39	4.62
	102	7	13.30	9.46
	105	7	7.60	5.82
Lauderdale ²	21	7	10.36	0.44
Tishomingo ³	118	7	17.91	0.0
Total			232.88	84.84

¹USDA – SCS, Soil Survey of Colbert County, Alabama, 1994

²USDA – SCS, Soil Survey of Lauderdale County, Alabama, 1977

³USDA – SCS, Soil Survey of Tishomingo County, Mississippi, 1983

Alternative C

With regard to impacts to farmland, the only difference between Alternative Bs and C is allocation of Parcel 53. For this alternative, this parcel is allocated to Zone 4, Natural Resource Conservation, and would be protected from development. The total acreage of prime farmland allocated for new development by this alternative is 56.86 acres (Table 4.8-3). As with Alternative B, the associated Pruitton - Dullivan silt loam soils located on slopes from 0 to 2 percent are the most prevalent prime farmland soils. Only one “Farmland Conversion Impact Rating” was completed using the maximum acreage of prime farmland potentially to be converted. Since the ratings which are described for Alternative B do not exceed the 160 threshold score, the rating for Alternative C would not exceed the threshold. Impacts to farmland by selection of this alternative would be insignificant.

Table 4.8-3. Prime Farmland on Parcels Allocated to Zone 7 by Alternative C				
County	Parcel No.	Zone	Total Acres	Prime Farmland Acres
Colbert ¹	43	7	36.85	33.11
	57	7	21.29	0.0
	94	7	3.41	3.41
	98	7	8.39	4.62
	102	7	13.30	9.46
	105	7	7.60	5.82
Lauderdale ²	21	7	10.36	0.44
Tishomingo ³	118	7	17.91	0.0
Total			119.11	56.86

¹USDA – SCS, Soil Survey of Colbert County, Alabama, 1994

²USDA – SCS, Soil Survey of Lauderdale County, Alabama, 1977

³USDA – SCS, Soil Survey of Tishomingo County, Mississippi, 1983

Comparison of Alternatives

The potential for converting prime farmland is greatest with allocations defined by Alternative A, because more acreage is allocated for development zones than by the other alternatives.

Under Alternative C, less acreage of prime farmland is allocated for potential development than under Alternative B, 56.86 compared with 84.84 acres. However, the Farmland Conversion Impact Rating for either alternative is below the 160 threshold. Selection of either Alternative B or C would have insignificant impacts to prime farmland.

Residential access lands containing prime farmland are the most likely parcels to be developed on Pickwick Reservoir. Development of privately-owned land in the adjacent areas could potentially result from these allocations. These indirect impacts are expected to be minimal. Development trends would probably continue as a function of population growth.

4.9 Cultural Resources

A Programmatic Agreement (PA) for the identification, evaluation and treatment of historic properties that are eligible for inclusion in the NRHP on TVA public land has been executed for the state of Alabama and one is under development and will be executed within the state of Tennessee. Until the PA is executed in the state of Tennessee, a phased identification and evaluation procedure will be used. The remaining land in the state of Mississippi will incorporate a phased identification and evaluation procedure to take into consideration the effects on historic properties. Together, these agreements and commitments address all TVA fee-owned land and other land that would be affected by TVA and undertakings associated with the Pickwick Reservoir Land Management Plan. The National Register eligibility for identified historic properties will be evaluated in consultation with the Alabama, Mississippi, and Tennessee State Historic Preservation Officers (SHPOs) and other consulting parties according to stipulations of the PAs and the requirements of Section 106 of the NHPA. Furthermore, mitigation of adverse effects to any historic property will be conducted according to the stipulations in the appropriate PA.

4.9.1 Archeological Resources

The majority of the land (77 percent) has been opportunistically surveyed for archaeological resources, while the remaining land (23 percent) has not been surveyed. Under any of the alternatives, the land that has not been investigated will require a systematic survey in order to identify and evaluate any archaeological resources that may exist. If a land use proposal has the potential to affect archaeological resources, then TVA, in consultation with the SHPO and other consulting parties, would conduct further evaluations to determine the resources' eligibility for inclusion in the NRHP, and appropriate review under Section 106 of the NHPA would be conducted.

Under the No Action Alternative, site-specific activities proposed in the future would be approved, mitigated, or denied according to the significance of the resource. If mitigation is required, appropriate archaeological investigation would be necessary and potentially affected resources would be properly recorded and removed. The 1981 Plan does not provide for specific preservation of archaeological resources; however, TVA will comply with regulatory requirements of NHPA and the Archeological Resources Protection Act (ARPA).

Under Action Alternatives B and C, TVA would incorporate a phased identification and evaluation procedure to take into consideration the effects on historic properties. Early identification of historic properties and allocation to Zone 3, Sensitive Resource Management, would avoid potential adverse effects. This would in turn save time, reduce costs, and ensure more efficient compliance with Section 106 of the NHPA than does Alternative A. Any activity that could affect historic properties would require identification and evaluation surveys pursuant to 36 CFR § 800.

Archaeological resources have been identified in all land plan zones. Under Alternatives B and C, approximately 76 percent of identified archaeological resources are allocated to Zone 3, Sensitive Resource Management, and Zone 4, Natural Resource Conservation, where TVA would emphasize preservation and protection. Approximately 24 percent of the archaeological resources are on land allocated to Zone 2, Project Operations, Zone 5, Industrial/Commercial Development, Zone 6, Developed

Recreation, and Zone 7, Residential Development. Activities proposed in Zones 2 through 7 would require further environmental and Section 106 review prior to the implementation of a project.

Alternatives B and C propose differing zone allocations for three parcels that contain approximately 145 acres. There is one known archaeological site located within this acreage. Alternatives B would allocate this site in Zone 5, Industrial/Commercial Development. Alternative C would place the known archaeological site and any unrecorded archaeological sites into Zone 4, Natural Resource Conservation. Alternative C would protect more historic properties by reducing the potential for adverse effects that may be associated with industrial or recreational development.

Fewer archaeological resources would be affected under Alternatives B or C than under Alternative A because many recreation parcels would be allocated to Zone 4, Natural Resource Conservation, or Zone 3, Sensitive Resource Management, and, therefore, subject to less proposed disturbance. Between Alternatives B and C, Alternative C would be slightly more protective of archeological resources than Alternative B because of the placement of three parcels in Zone 4, Natural Resource Conservation, under Alternative C.

4.9.2 Historic Structures

Under the No Action Alternative, site-specific activities proposed in the future would be approved, mitigated, or denied according to the significance of any historic structures. This would require a survey of the APE to determine what features exist on TVA public land or adjacent non-TVA public land.

Under Alternatives B and C, all uncommitted TVA public land with historic structures would be allocated to Zone 3, Sensitive Resource Management, or Zone 4, Natural Resource Conservation, for protection. Alternatives B and C place more historic resources in land use categories that will provide cultural resource protection than Alternative A. There does not appear to be significant differences between Alternatives B and C for historic structures with information currently known. Under all alternatives, assessment under Section 106 of the NHPA would take place for any proposed activities that have the potential to affect historic resources identified on or adjacent to TVA parcels.

Under all three alternatives, Parcel 36 is allocated to Zone 5, Industrial/Commercial Development. This parcel includes remnants of the old Muscle Shoals Canal, and the later Lock No. 1 of the Wilson Dam complex. All soil-disturbing activities, such as dredging, shoreline excavations, etc., would need to be reviewed for remains of these historic features. Parcel 41 is allocated to Zone 7 and includes the former Keller Quarry Landing. A stack of large quarried stones is present. Though most of the stones are possibly on private land, portions are on TVA public land. All activities along this shoreline would need to be reviewed for effects on these cultural resources. Parcels 26, 61, 63, and 66 are allocated to Zones 6 and 7. Along this shoreline, generally under water, is the Colbert Shoals Canal (see Section 3.9). Any activities involving offshore dredging or below-surface excavation will need to be reserved to avoid impacts to this resource. Parcels 67 and 68 are allocated to Zones 3 and 7. The former river port town

of Riverton is located here. Dredging in the vicinity of the previous streets would need to be avoided. For Parcel 156, the White Sulphur Springs cabins are currently owned by the individual leasees, who can legally make any alterations to the cabins, including demolition. Therefore, the action of selling the land to the cabin owners would not result in any adverse impact. However, sale of the land could give the cabin owners expanded options. Should this be determined an adverse effect by the TN SHPO, TVA will negotiate mitigation measures with the SHPO. Beneficial mitigation could be documentation of these cabins before they inevitably are changed. Information including interior and exterior photographs with a basic floor plan should be collected and put in a report for limited distribution.

Cumulative impacts, both adverse and positive, are always a reality concerning historic structures. This is further complicated because most of these historic structures are not on TVA public land but are on adjacent private property. What TVA does on an individual tract could have a ripple effect on what happens on adjacent private land. For instance, if TVA enhances a tract which in turn encourages nearby residential development, then the possible historic farm complex becomes subdivided for lots; then the farm buildings are abandoned and demolished; the remaining historic farmhouse may or may not survive, but has lost its historic setting. These cumulative impacts would be addressed while assessing the impact of any undertaking proposed in the future.

4.10 Air Quality

Industrial/Commercial Development

Any new or expanding industrial or commercial facilities would be required to meet applicable federal and state requirements in effect at the time of their development or expansion. Any facilities on TVA public land or facilities in the surrounding area with potentially significant air pollutant emissions would be required to obtain an air quality permit from the applicable state. The permit application and review process would evaluate the magnitude of air emissions from the proposed source and from existing sources, meteorological factors that affect dispersion of the pollutants, and the potential for effects on areas with special air quality requirements, such as nonattainment areas and PSD Class I areas. The appropriate level of environmental review would be conducted for future specific proposed actions involving TVA-controlled land. Commitments or restrictions, such as covenants to mitigate potential impacts, could result from these reviews. Effects from site preparation and construction activities, from post-construction traffic, and from operation of minor sources would be similar to those discussed below for residential development and the same state rules would apply.

Residential Development

For any TVA allocation decisions, including residential development, any direct, indirect, and cumulative air emissions impact is to be minimized. Pollution from fossil-fuel combustion in construction equipment, fugitive dust emissions from operation of this equipment during dry conditions, increased traffic during construction, and any open burning would cause some minor and temporary air quality degradation in the vicinity of the reservoir. However, State air pollution rules require construction projects to use reasonable precautions to prevent fugitive dust emissions and to avoid open burning under adverse conditions such as air quality advisories or fire alerts. After construction is completed, normal residential activities, such as using wood stoves, fireplaces, and

gas-powered, grounds-keeping equipment, and increased traffic would contribute somewhat to deterioration in local air quality but would have little or no impact on regional air quality.

No Action Alternative (Alternative A)

Under Alternative A, the 1981 Plan would remain in place which currently guides land use decisions on TVA public land surrounding Pickwick Reservoir. The 1981 Plan used 10 allocation categories which would continue to be used by TVA to make land use decisions. A total of 434 up to 2,499.6 acres could be considered for Industrial/Commercial Development and the 1981 Plan did not allocate residential shoreline or other shoreline strips along the reservoir. Appropriate level of environmental reviews would be done to document the extent of expected air quality impacts whenever a proposed land use request is received.

Alternatives B and C

Under Alternatives B and C, TVA would update land allocations using resource data, computer analyses, stakeholder input, and TVA staff input to generate a proposed mix of land allocations. Under Alternative B, 534.45 acres would be allocated to Zone 5, Industrial/Commercial Development. Under Alternative C, 450.34 acres would be allocated to Zone 5, Industrial/Commercial Development. An environmental review would be performed for each expansion or development proposal to document that insignificant impacts on air quality would be expected.

4.11 Navigation

Alternative A

The current land plan identifies and allocates shoreline for seven safety landings and harbors on Pickwick Reservoir. TVA prohibits the construction of water-use facilities and shoreline alterations within the marked limits of safety landings and harbors. The only acceptable shoreline alteration within these limits would be the placement of riprap for control of erosion. Under this alternative, the safety landings would continue to be available for use by the towing industry and private recreational vessels, and there would be no impact on commercial and recreational navigation.

Alternatives B and C

Under Alternatives B and C, the land use allocation for the shoreline area where the safety landings and harbors are located would include an allocation for the continued use of the facilities and would have little impact on navigation. To avoid interference with commercial navigation, the current practice of prohibiting the construction of water use facilities and shoreline alterations within the marked limits of the safety landings and harbors would be continued. In addition, requests for water use facilities on shoreline immediately upstream and downstream of the safety landings and harbors would continue to be reviewed to ensure that barge tows would have sufficient room to maneuver in and out of the safety landings and harbors without the risk of damaging private property.

4.12 Recreation

Alternative A

Under the 1981 Plan, the only two recognized activities for Developed Recreation were boat ramps and campgrounds. The 1981 Plan does not consider recent public input in the management of public land nor the benefit of approximately 20 years of public land management experience since the 1981 Plan was prepared.

Alternatives B and C

Under these alternatives, land with concentrated, active recreation activities that require capital improvement and maintenance would be allocated to Zone 6, Developed Recreation. The allocation of Parcel 128 to Zone 3, Sensitive Resource Management, would provide a buffer for the large amount of recreational and commercial boating traffic at that location. Existing uses such as state and local government recreation developments are recognized, and public comments considered.

Under Alternative B, informal public use of 1,351.78 acres in Zone 3 and 12,078.52 acres in Zone 4 categories is continued. Parcel 37 would be allocated to Zone 6, Developed Recreation, to accommodate the city of Florence's request for public recreation facilities including trails and an overlook.

Under Alternative C, informal public use of 1,351.78 acres in Zone 3 and 12,219.60 acres in Zone 4 would be continued. More land is allocated to Zones 3, Sensitive Resource Management, and 4, Natural Resource Conservation, and less land to Zone 6, Developed Recreation, under Alternative C than under Alternative B. Under Alternatives B and C, Parcel 85 would be allocated for future public recreation development. It currently receives considerable informal camping and day use pressures. Public requests for additional boat access areas can be accommodated in existing Zone 6 areas and also are compatible with Zone 4, Natural Resource Conservation, areas including the Lauderdale and Seven Mile Island WMAs. The cumulative effects of either alternative are insignificant. Under either action alternative, TVA would respond to inquiries for new public recreation opportunities on a case-by-case basis and would seek partnerships with other public entities to develop, manage, and maintain the facilities.

4.13 Visual Resources

Impacts to the visual resources throughout Pickwick Reservoir are assessed on the basis of how proposed actions will affect the visual character as viewed by observers.

Alternative A

Under the No Action Alternative, areas were designated for visual protection to encourage management techniques that would result in either no change or a positive change to the visual character. Under this alternative, requests for land use would continue to be processed and assessed on a case-by-case basis. This would provide minimal oversight in regard to the visual resource management of the entire reservoir. Increasing development and disturbance would further generate adverse visual contrast and congestion. The site specific reviews would have to include evaluation of

cumulative impacts to satisfy the objective of either change or a positive change to the visual character throughout the reservoir.

Alternatives B and C

Public comments were considered when parcels were inventoried and analyzed for scenic attractiveness and integrity. Generally, land that is appreciated for its intrinsic visual quality is also the most sought after for private development. Alternatives B and C would address the protection and preservation of valued scenic resources by allocating parcels in one of two categories.

- Parcels with the highest scenic attractiveness and scenic integrity would be allocated to Zone 3, Sensitive Resource Management. Parcels would be managed in a manner that preserves and protects sensitive and unique visual resources. This approach would serve to balance increasing development throughout the reservoir and provide observers with unaltered, naturally appearing landscapes.
- Parcels with similar, but less outstanding and less distinct, visual resources would be allocated to Zone 4, Natural Resource Conservation. Under this allocation, land that is valued for landscape character would be more accessible to the public by allowing low-impact human alteration without significantly altering the established visual character of the area.

Public comments showed more concern about the environment and scenic areas (see Appendix A). Alternatives B and C would address the concerns voiced in public meetings by protecting visual resources and managing public land to preserve naturally appearing landscapes. Under Alternatives B and C, 13,430 and 13,571 acres would be allocated to Zones 3, Sensitive Resource Management, and 4, Natural Resource Conservation, respectively. Compared to Alternative A, this is an increase of up to 38.3 and 39.0 percent, respectively. Both alternatives would provide protection for existing visual resources with little cumulative impact. As acknowledged in the public comments, current development patterns and construction practices can often adversely impact the visual resources of Pickwick Reservoir. Therefore, under Alternative B, requests for the alteration or development of Parcel 156 would need to include mitigation measures, such as vegetation management plans, use of architecturally compatible styles/colors, and height restrictions to maintain the scenic attractiveness without adversely impacting the scenic integrity. Alternative C would maintain scenic integrity and attractiveness at a moderate to high level with the least impact. This alternative would provide for the greatest protection of naturally appearing landscapes.

4.14 Socioeconomic Impacts

Under the No Action Alternative, Alternative A, TVA would continue to follow the 1981 Plan. Two alternative actions, B and C, have been proposed. These two differ very little in terms of the acreage allocated to various land use zones. Hence, there would be no important differences between Alternatives B and C with regard to socioeconomic impacts. However, the differences between Alternatives B and C and Alternative A in terms of land use do have socioeconomic implications. The major changes in proposed land use under B and C include (1) a 5.2 percent increase (142 acres) in Zone 2, Project Operations, (2) up to a 78.7 and 82.2 percent decline (1,970 and 2,055 acres) in Zone 5, Industrial/Commercial Development, and (3) up to a 45.6 and 53.8 percent decline

(1,130 and 1,166 acres) in Zone 6, Developed Recreation, respectively. These percentages reflect the change in acreage allocated to the zone. For example, Zone 2 has increased by 5.2 percent (from 2,718 to 2,861 acres), using the original acreage for a given zone as the baseline. The second and third major changes have socioeconomic implications.

The decline in land allocated to Zone 5, Industrial/Commercial Development, may result in the creation of fewer manufacturing jobs compared with Alternative A. The decline in land allocated to Zone 6, Developed Recreation, may result in the creation of fewer retail and service jobs. Any loss of potential manufacturing jobs is likely to be of greater economic significance than in the loss of potential retail and service jobs associated with a decline in recreational development opportunities for two reasons: (1) manufacturing jobs tend to be higher paying, (2) manufacturing firms tend to have greater indirect economic impacts on the surrounding area.

However, the loss of potential jobs and any associated decline in income relative to Alternative A would not materialize if comparable, alternative development sites exist within the four-county area. In this case, development could shift from reallocated Pickwick Reservoir land to other sites in the area. It is even possible that other sites would be the first choice for development anyway. Existing industrial development sites (land that is currently being marketed) in the four-county area total over 3,500 acres, compared with the approximately 2,000 acres of industrial/commercial zoned land that could be potentially lost under Alternatives B and C. The majority of this acreage is located in Tishomingo and Lauderdale Counties. Unless much of this acreage becomes unavailable, it will likely be able to absorb most of the development that might otherwise have occurred in the Pickwick Reservoir area. This land even includes considerable waterfront acreage, which is one feature of Pickwick Reservoir land that is not always duplicated at other sites.

4.15 Environmental Justice

TVA is not aware of any minority or lower income communities adjacent to its properties that would be affected by the allocations. Any socioeconomic impacts associated with development projects under any of the alternatives are unlikely to disproportionately affect minorities or the poor, given the lower percentage of these groups in the area as compared with the three states home to the Pickwick Reservoir counties.

The determination of (the potential for) disproportionate adverse health and environmental effects on minority or poor populations hinges on the geographic scale of analysis and the reference population. Minorities and those living below the poverty level in the four-county area make up a smaller percentage of the population than they do in the three-state area, whereby no disproportionate effects are possible at this scale. The total minority and poor population in just those census tracts that include retained TVA public land on Pickwick Reservoir is similarly proportionately less than (or no more than) the same population groups in the four-county area and the three-state area. Again, at this level, disproportionate effects are precluded. A comparison of these census tract populations with just the population of the county in which they are located indicates that total minority and poor populations in these census tracts within Colbert, Hardin, and Tishomingo counties are not disproportionately high. However, those census tracts in Lauderdale County have a slightly higher proportion of minorities and

poor (15.7 and 17.4 percent versus 12.2 and 14.6 percent) than the county as a whole. Any development project requiring TVA approval would receive the appropriate level of environmental review, including environmental justice review.

4.16 Other Issues - Noise

The greatest potential for community noise impacts comes from industrial and commercial development, commercial transportation, and, to a lesser extent, from commercial recreational development. In comparing the land use allocations in Alternatives B and C, the potential for community noise impacts is substantially reduced because of the large potential decrease in land available for noise-producing activities compared to Alternative A. Under Alternatives B and C, the land available for Zone 5, Industrial/Commercial Development, could change from an increase of about 99 acres to a decrease of up to 2,055 acres. Any potential increase would not likely be new industrial/commercial land, but would be adjacent to current industrial/commercial land with similar activities, and its potential for increased noise effects would be insignificant. The decrease of up to 2,055 acres would significantly lower the potential for future noise effects. Decreasing the industrial/commercial allocation would also reduce the potential for noise impacts from commercial transportation in those areas.

Maximum land allocated for Developed Recreation will decrease if either Alternative B or C is approved. These reductions range up to 1,131 acres for Alternative B and 1,166 acres for Alternative C. The Zone 7, Residential Access, allocations of 1,085 and 1,064 acres for Alternatives B and C have no base for comparison, since residential was not a classification in the 1981 allocation categories. Noise from new residential development should follow the established noise patterns of the reservoir. New residents will use the reservoir for recreation, such as boating, at the same time current users do, usually in the warm months and on weekends. This would cause an insignificant effect on the noise environment.

There is a substantial increase in the land allocated to Sensitive Resource Management and natural resource conservation. This would decrease the potential for noise effects in those allocations.

Based on the amount of TVA public land available for development and the additional environmental evaluations, there would be no—or an insignificant increase in the potential for—community noise impacts from implementation of the action alternatives in comparison with Alternative A; Alternative C would have the least impacts.

4.17 Unavoidable Adverse Effects

Because of the requirement that site-specific environmental reviews will be conducted prior to implementation, there are currently few, if any, adverse environmental effects which cannot be avoided should Alternative B or C be implemented. However, regional development trends, such as residential shoreline development, will continue to result in losses of aquatic and terrestrial habitat. These losses would occur anyway and are not related to implementation of the Plan.

Under Alternative A, Parcel 128, an uncommon plant community (open cliff face dominated by alumroot) would be under some threat from future development. Impacts

to terrestrial ecological resources would be potentially significant because of this threat. Significant impacts to state-listed plant species would be expected. Because of the potential for future development under Alternative A, the farmland on 4,067.9 acres could potentially be converted.

Under Alternatives B and C, Parcel 128 would be allocated to Zone 3 (Sensitive Resource Management). This allocation would afford protection to the state-listed species that occur here. Therefore, impacts to state-listed plant species are expected to be beneficial. The decline in land allocated to Zone 5, Industrial/Commercial Development, may result in the creation of fewer manufacturing jobs compared with Alternative A. The net consequence of Alternative B and C is likely to be lower per capita income growth for the Pickwick Reservoir area.

4.18 Relationship of Short-term Uses and Long-term Productivity

Commitments of the shoreline to residential access, commercial, industrial, and some types of recreational development are essentially long-term decisions that would decrease the productivity of land for agricultural, forest, wildlife, and natural area management. Long-term productivity decreases would likely be greatest under Alternative A. As described in earlier sections, the types of changes that occur with residential development would result in a decline in the habitat quality for some terrestrial species and increase the habitat for others. Many of the water-related impacts of shoreline development could be minimized by the use of appropriate controls on erosion, added nutrients, and pesticide input.

Increased residential development could occur under all alternatives and result in population increase along the shoreline. New jobs and income would be generated by the spending activities of these new residents, leading to enhanced long-term socioeconomic productivity. This would be the case as long as the desirable features that prompted their move to the shoreline were maintained or enhanced.

4.19 Irreversible and Irrecoverable Commitments of Resources

Irrecoverable use of nonrenewable resources (i.e., fuel, energy, and some construction materials) could occur under Alternatives A, B, and C due to residential shoreline development as well as commercial, industrial, and some types of recreational development. The residential development would result in region-wide population increase. This means that the same development could occur somewhere else in the region. Therefore, use of most (if not all) of these resources could occur somewhere else in the region to provide the same residential development services regardless of the alternative chosen.

As shoreline is converted to residential, commercial, industrial, and some types of recreational use, the land is essentially permanently changed and not available for agricultural, forestry, wildlife habitat, natural area, and some recreation uses in the foreseeable future. This is an irreversible commitment of land which would occur under all alternatives; over the long term, it would likely be greater in magnitude under Alternative A.

4.20 Energy Requirements and Conservation Potential

Energy is used by machines for fuel to maintain grassy areas on the dam reservation and by the operation of the hydroelectric plant located at Pickwick Landing Dam. There are no short-term energy uses required for the dam reservation as it is already established.

Energy is also used by machines to maintain areas set aside for Natural Resource Conservation. Although these activities are not likely to have much influence on regional energy use demands either, there would be some short-term energy use for fuel to conduct prescribed natural resource conservation activities, such as mowing, timber management, controlled burning, disking, planting of small grain crops, etc. Alternative C would have a greater requirement for this type of energy use, since it contains the largest amount of acreage allocated for Natural Resource Conservation.

Comparable amounts of TVA public land (6.3 up to 7.0 percent) are allocated to Zone 3, Sensitive Resource Management, under all three alternatives. Some areas set aside for protection of archeological sites could potentially be maintained by mowing, light disking, or controlled burning. There would be some short-term energy use of fuel for machines to conduct these types of activities. The level of these activities is considered minimal.

4.21 Mitigation Commitments

The following commitments would be used in preparing the Record of Decision for the FEIS.

Under all alternatives:

- All soil-disturbing activities, such as dredging, shoreline excavations, etc., on Parcels 26, 36, 41, 61, 63, 66, 67, and 68 would be conducted in a manner to avoid impacts to cultural resources.
- The construction of water use facilities and shoreline alterations within the marked limits of the safety landings and harbors would be prohibited.
- Requests for water use facilities on shoreline immediately upstream and downstream of the safety landings and harbors would continue to be reviewed to ensure that barge tows would have sufficient room to maneuver in and out of the safety landings and harbors without the risk of damaging private property.
- Because caves are extremely fragile and biologically significant, TVA has placed and would continue to maintain protective buffer zones around each of the known caves on TVA public land on Pickwick Reservoir.

Under Alternative B:

- Wetlands on Parcel 37 would be mitigated by avoiding wetland areas, including small upland buffers.
- Corridors for water access across Parcel 53 would be designed to avoid impacts to terrestrial habitat and wetlands.

- Requests for the alteration or further development of this Parcel 53 would need to include BMPs and maintenance of a 50-foot SMZ to reduce potential impacts.
- Should TN SHPO determine an adverse effect for the allocation of Parcel 156 to Residential Access, TVA will negotiate mitigation measures with the SHPO.
- Requests for the alteration or development of Parcel 156 would need to include mitigation measures, such as vegetation management plans, use of architecturally compatible styles/colors, and height restrictions to maintain the scenic attractiveness without adversely impacting the scenic integrity.