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FINAL ENVIRONMENTAL ASSESSMENT

STATE ROUTE 27 (U.S. HIGHWAY 72) INTERCHANGE MODIFICATION AT INTERSTATE HIGHWAY 24 MARION COUNTY, TENNESSEE

TENNESSEE VALLEY AUTHORITY

MARCH 2010

The Proposed Decision and Need

The Tennessee Department of Transportation (TDOT) submitted to the Tennessee Valley Authority (TVA) on March 5, 2008, a Land Use Application requesting a permanent easement over three sections of TVA land (approximately 15.2 acres) on Guntersville Reservoir for new highway right-of-way near Kimball in Marion County, Tennessee (see Attachment 1 and Figure 1). One section (14.6 acres) is located on property known as Parcel 167 in the TVA 2001 *Guntersville Reservoir Final Environmental Impact Statement and Land Management Plan* (Land Plan), and the other two sections (0.1 acre and 0.5 acre) are located on property known as Parcel 166.

Parcel 167 is a 26.3-acre parcel that was allocated for Zone 5 (Industrial/Commercial) use due to a request during the land planning process by Marion County officials. Tract 167 will require a Land Plan allocation change from Zone 5 to Zone 2 (Project Operations), and this allocation change will require TVA Board approval. TVA Parcel 166 is identified in the Land Plan as a 257.2-acre parcel that is allocated for Zone 3 (Sensitive Resource Management) to protect visual, cultural, and wetland resources. Parcel 166 will not require a land allocation change.

There are currently four ramps that provide access between Interstate Highway (I-) 24 and State Route (SR) 27 (U.S. Highway [US] 72). Three of these are directional ramps (SR 27 [US 72] to I-24 westbound; I-24 eastbound to SR 27 [US 72]; and SR 27 [US 72] to I-24 eastbound), and one is a loop ramp (I-24 westbound to SR 27 [US 72]). All of the ramp terminals with I-24 are geometrically insufficient, except for the ramp from I-24 eastbound to SR 27 (US 72). Constructing another directional ramp from I-24 westbound to SR 27 (US-72) northbound in the northeast quadrant of this interchange is necessary to reduce the traffic volume on the existing heavily traveled loop ramp that currently carries traffic from I-24 westbound to SR 27 (US 72) northbound and southbound.

The vertical clearance above SR 27 (US 72) (under the I-24 bridges) varies from 14.9 feet to 15.73 feet. A minimum of a 16-foot clearance is recommended for freeways and arterial systems (16.5 feet for new construction to accommodate future resurfacing). These bridges have been struck several times by tall trucks. The existing bridges would be replaced with one 60-foot-wide bridge constructed to accommodate future lane widening. The vertical clearance would be raised to 16.5 feet and would allow for repaving as required. The proposed highway improvements would be constructed concurrently with the

bridge replacement in order to reduce overall construction costs, downtime, and lengthy traffic congestion.

All roadway improvements are intended to increase travel safety at this interchange. In addition to improving safety, the proposed project would increase the efficiency and improve operational characteristics of the existing interchange, which provides access between I-24 and SR 27 (US 72). These interchange modifications would make these routes safer for the traveling public and lead to more efficient movement of goods and services through the area.

On September 25, 2009, TDOT also submitted to TVA a request under Section 26a of the *TVA Act* for approval for excavation, fill, culvert extensions and channel relocations in order to construct a new directional ramp, improve existing ramps, and replace the existing bridge, all associated with the improvements at the SR 27 (US 72) interchange with I-24. Construction will include the permanent impact and fill of approximately 10.2 acres of wetlands and a total of 206 feet of stream impact to two unnamed tributaries of Battle Creek for culvert extension, partial channel relocation, utility relocation, and possible future installation of a flap gate and flood gate structure. The project would also include the construction of an 11.1-acre retention basin to compensate for loss of flood storage.

TVA's action would be to grant a permanent easement over 15.2 acres of TVA land for the additional right-of-way. TVA would change the allocation for Parcel 167 from Zone 5 to Zone 2. TVA also needs to decide whether to approve or deny the Section 26a permit requested by TDOT for the proposed excavation, fill, culvert extensions and channel relocations to accommodate the construction of the proposed interchange improvements. The *TVA Act* gives TVA the responsibility of the unified development and regulation of the Tennessee River system. As part of this responsibility, 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. TVA's purpose is to ensure that its Section 26a requirements are met and that the proposed facility is compatible with TVA's integrated mission for flood control, navigation, power generation, reservoir recreation, land management, and environmental protection.

TVA has prepared this environmental assessment (EA) to evaluate the potential impacts of granting an easement and Section 26a approval to support this proposed highway improvement project.

Other Environmental Reviews and Documentation

TDOT completed a categorical exclusion (CE) for the proposed roadway improvements on February 7, 2005, and the Federal Highway Administration (FHWA) concurred on February 24, 2005 (see Attachment 2), that the CE adequately captures the anticipated impacts of the project. The TDOT review included discussions regarding wetlands, streams, and protected species and other resources in the project impact area. A reevaluation of the CE was completed by TDOT on August 27, 2007. FHWA concurred on August 31, 2007. No substantial changes in the environmental effects discussed in the earlier review were noted.

The TDOT review included coordination letters from the U.S. Fish and Wildlife Service (USFWS) dated October 28, 2004, and updated on December 11, 2007, stating that no

significant adverse impacts to wetlands or federally listed as endangered or threatened species are anticipated from the proposal. A search of Tennessee Department of Environment and Conservation's (TDEC) Division of Natural Areas' database conducted on February 28, 2006, and updated on July 16, 2007, and September 24, 2009, indicated that there are two federally listed species within a 1-mile radius and 12 federally listed species within a 1- to 4-mile radius of the project area. It was the determination of the TDOT biologist that these species would not be affected by the project because they are considered not likely to be present in the right-of-way due to one or more of the following reasons: present habitat unsuitable for the species, the species was not observed during site visit, or original record for this species was questionable. TDOT sent an e-mail to the Tennessee Wildlife Resources Agency (TWRA) on January 8, 2008, requesting their comments regarding the animal species. In a response dated January 24, 2008, TWRA stated that standard best management practices (BMPs) employed by TDOT would be sufficient to minimize impacts to rare species for this project. Updated analyses were conducted by TDOT in May 2009 and December 2009 that reevaluated potential wetland impacts.

The TDOT review also included a Tennessee Historical Commission (THC) State Historic Preservation Officer (SHPO) letter dated December 16, 2002, stating that the area of potential effect for this undertaking contains no cultural resources eligible for listing in the National Register of Historic Places (NRHP).

TVA completed Categorical Exclusion Checklist 20339 (see Attachment 3) on January 11, 2010, to evaluate potential impacts to other additional resources. This review indicated that preparation of an EA was necessary. No impacts were identified to other resources not described in this EA.

Alternatives and Comparison

There are two alternatives available to TVA: Alternative A, the No Action Alternative, and Alternative B, the Proposed Action Alternative.

Alternative A - The No Action Alternative

The No Action Alternative would result in the denial or withdrawal of the applicant's request for a grant of permanent easement over TVA land to accommodate the proposed public roadway improvements. TVA would also not issue a Section 26a approval for the wetland fill or stream alterations. TVA would not change the allocation of Parcel 167 from Zone 5 to Zone 2. No wetland or stream impacts mitigation would be required. This alternative would not meet the needs of the TDOT to improve roadway safety.

Alternative B - The Proposed Action Alternative

Under Alternative B, the project would be approved as proposed. The applicant would construct wetland mitigation at a ratio of 2:1 at the Sequatchie Valley Wetland Mitigation Site for 9.1 acres and at a ratio of 4:1 at the Coffee County Wetland Mitigation Bank for 1.1 acres. TDOT would also provide $41,200 to the Tennessee In-Lieu Fee Stream Mitigation Program to mitigate stream impacts. TVA would grant a permanent easement for 15.2 acres of TVA land to the TDOT and issue a Section 26a approval for roadway improvements. Safety concerns at the existing interchange would be addressed. Because highway safety would be improved considerably due to the proposed highway improvements, Alternative B is the preferred alternative.

TDOT considered other alternative designs that were considered to be impracticable options due to high costs.

Comparison of Alternatives

Under the No Action Alternative, the SR 27 (US 72) at I-24 roadway improvement project would not be built; thus, no wetland impacts would occur and no wetland mitigation would be required. Invasive species existing in the project area could continue to proliferate, which may contribute to the degradation of plant diversity and wildlife habitat in the area. There would be no impacts to state or federally listed as threatened or endangered plant, animal, or aquatic species. No effects to the aquatic ecology or water quality of the project area would occur. Under the No Action Alternative, no stream mitigation would be necessary. Visual resources would not be affected. There would be no effect to archaeological resources under either Alternative A or Alternative B because no cultural resources occur at the site.

Under Alternative B, 10.2 acres of wetlands would be filled and permanently impacted for construction of the improved SR 27 (US 72) at I-24 interchange. Wetland mitigation in the amount of 18.2 acres would be created for 9.1 acres of impact (at a 2:1 ratio) at the Sequatchie Valley Wetland Mitigation Site. The remaining 1.1 acres of impact would be mitigated by debiting (at a 4:1 ratio) 4.4 acres of available credits from the Coffee County Wetland Mitigation Bank. The applicant would provide compensatory mitigation for approximately 206 feet of permanent stream impacts (fill or placement in culverts), by making a payment of $41,200 Tennessee In-Lieu Fee Stream Mitigation Program. Use of this program would ensure that net stream loss due to this project is not a major impact.

Even though state- and federally listed species are reported from Marion County and three state-listed species are known to occur within 5 miles of the project area, habitats to support these species are not present within or adjacent to the proposed SR 27 (US 72) at I-24 interchange. Use of appropriate BMPs during construction to prevent impacts to water quality in the Tennessee River (Guntersville Reservoir) would prevent impacts to state- and federally listed species known to occur in the river. Therefore, under Alternative B, no impacts to state- or federally listed as threatened and endangered species are expected.

Under Alternative B, highway improvements would impact herbaceous vegetation in the form of hayfields and successional fields on Parcels 166 and 167. During project construction, impacts are anticipated to riparian areas and scrub-shrub wetlands present on Parcel 167. The loss of habitat would have minor impacts to terrestrial wildlife resources in the project area. Since plant and animal communities in the project area are common and representative of the region, impacts to the terrestrial ecology are expected to be minor and regionally insignificant.

Visual impacts to Parcel 166 (0.6 acre) would be minor when compared to the overall number of acres (257.2) allocated to the Sensitive Resource Management of this parcel. The proposed TDOT improvements on Parcel 167 would be visually compatible with its current use. The improved interchange would be visually similar to human alterations seen in the landscape now from the parcel.

Affected Environment and Evaluation of Impacts

Land Use

The 2001 Land Plan provides that "compatible public works/utility projects proposed in Zone 3 and Zone 4 will require an environmental review but will not require an allocation change." The Land Plan does not include similar compatibility language for Zone 5 (Industrial/Commercial) allocated parcels, and use of the whole tract for infrastructure rather than its intended use may not be compatible.

In 1966, TVA granted a permanent easement over a 28-acre tract of land to TDOT for the construction of I-24 at the intersection with SR 27 (US 72). TDOT is now requesting three additional sections (for a total of 15.2 acres) that are immediately adjacent to the existing easements. The largest of the three sections, 14.6 acres, is located within Parcel 167. The parcel was allocated for Zone 5 at the request of Marion County to support additional development in the Kimball area. The parcel is in a developing commercial area, and TVA believed during that 2001 planning effort that allocating the parcel to Zone 5 would promote economic growth. However, in September 2007, TVA reassessed Zone 5 allocated parcels in *TVA Land Policy Assessment for Economic Development* to verify suitability of the properties for this use. The results of the assessment included a recommendation that 10 Zone 5 parcels be considered for allocation to other uses. Parcel 167 was one of 10 parcels not suitable for Zone 5 development. A more suitable use for Parcel 167 was determined to be a flood collection point and wetlands.

The following easements are in place on Parcels 166 and 167:

Easement ID	Utility	Parcel No.	Area (acres)	Date
XGR-650H	TDOT	166	17.7	04/26/1966
XGR-697H	TDOT	166	0.7	08/11/1971
XTGR-159H	TDOT	167	0.3	01/26/1994
XGR 650H	TDOT	167	28.8	04/26/1966
XGR-618P	Gas	166	1.3	07/30/1958
XGR-649P	Gas	166	1.1	11/25/1963
XTGR-158S	Sewer	166	0.4	11/29/1993
XTGR-131S	Sewer	166	0.9	10/16/1979
XGR-711S	Sewer	166 and 167	0.9	11/20/1973
XGR-685P	Water Pipeline	166	0.6	04/08/1969
XGR-763AR	Private access	167	0.3	11/2/2007
TV-80719V	Sufferance Agreement	167	0.04	7/24/1990

The newly proposed easement area is immediately adjacent to two previous permanent easements conveyed for highway purposes to the State of Tennessee (TVA Tract Nos. XGR-650H and XGR-697H). The proposed easement area also overlaps a permanent easement conveyed for highway purposes to the State of Tennessee (TVA Tract No. XTGR-159H). The proposed easement is also affected by and will be conveyed subject to the following disposal tracts:

- TVA Tract No. XGR-711S, a permanent easement for a sewage effluent line conveyed to Junction Enterprises. Portions of the proposed easement will overlap said sewage easement. This easement was conveyed for a private sewer line.

- TVA Tract No. XGR-618P, a permanent easement for a gas pipeline conveyed to City of South Pittsburg, Tennessee. Portions of the proposed easement will overlap said gas pipeline easement.

- TVA Tract No. XGR-649P, a permanent easement for a water pipeline conveyed to City of South Pittsburg, Tennessee. Portions of the proposed easement will overlap said water pipeline easement.

- TVA Tract No. XGR-685P, a permanent easement for a water pipeline conveyed to City of South Pittsburg, Tennessee, Board of Water Works. The proposed easement appears to be adjacent to and possibly overlaps said water pipeline easement.

- TVA Tract No. XTGR-158S, a permanent easement for sewer line purposes conveyed to Town of Kimball, Tennessee. Portions of the proposed easement will overlap said sewer line easement.

- TVA Tract No. XTGR-131S, a permanent easement for sewer line purposes conveyed to Town of Kimball, Tennessee. Portions of the proposed easement will overlap said sewer line easement.

- TVA Tract No. XGR-763AR, a permanent easement for an access road conveyed to Kamala Hospitality Group. This easement is immediately adjacent to the proposed easement and is for private access. A determination should be made whether the TDOT request will interfere with the Kamala easement.

- Contract No. TV-80719V, a Sufferance Agreement for a Retaining Wall, entered into between the USA and Jimmy L. Carter, dated July 24, 1990, of record in Deed Book 142, page 149, in the office of the Register of Marion County, Tennessee. The proposed easement is adjacent to the property covered by the sufferance agreement.

Under the No Action Alternative, there would be no change to existing agreements or land use. Under Alternative B, it would be necessary for TDOT to coordinate its activities in the proposed easement area with the owners of the above-referenced easement rights. An agricultural license on Parcel 167 would be canceled to support the proposed action. The other agreements would not change, but a new permanent easement to TDOT would be subject to those agreements. In order to complete the proposed roadway improvements, TDOT would relocate a couple of water and gas lines, but the relocations would only change the survey description of those agreements.

Wetlands

The I-24/SR 27 (US 72) interchange is located in the Sequatchie River watershed, and within the Sequatchie Valley ecoregion IV, a subdivision of the Southwestern Appalachian ecoregion, which occurs between the Blue Ridge Mountains on the east to the Interior Plateau on the west (Griffith et al. 2001). Land use/land cover data generated by the U.S.

Environmental Protection Agency in 2001 indicated wetlands comprise approximately 2,250 acres, or less than 1 percent, of overall land use types in the Sequatchie River watershed (TDEC 2008).

Field surveys were conducted by TDOT in 2004 to determine types and locations of wetlands present within the boundaries of the proposed interchange modification. Updated analyses were conducted by TDOT in May 2009 and December 2009, which reevaluated potential wetland impacts. Three wetlands were found within the project area. Jurisdictional wetlands occur in the northeast quadrant of the interchange project site in the area of the proposed off ramp of I-24 and southeast and southwest portions of I-24 interchange adjacent to the interstate.

Wetland Impacts Associated With the Proposed I-24/SR 27 Interchange Project

Wetland #	Wetland Type	Temporary Impacts (acres)	Permanent Impacts (acres)
WTL-1	Emergent/scrub-shrub	0.65	10.08
WTL-2	Emergent/forested	0.15	0
WTL-3	Forested	0.73	0.12
TOTAL		**1.53**	**10.2**

Activities in wetlands are regulated under Section 404 of the *Clean Water Act*, as well as Executive Order (EO) 11990. Under Section 404, the U.S. Army Corps of Engineers (USACE) established a permit system to regulate activities in "Waters of the United States," including wetlands. This requires that authorization under either a Nationwide General Permit or an Individual Permit be obtained to conduct specific activities in wetlands. Additionally, Section 401 of the *Clean Water Act* requires water quality certification by the state for projects permitted by the federal government. EO 11990 requires agencies to minimize wetland destruction, loss, or degradation, and preserve and enhance natural and beneficial wetland values, while carrying out agency responsibilities.

Mitigation would be required under both state and federal regulations for the 10.2 acres of permanent wetland impacts. The applicant has agreed to the creation of 18.2 acres (a ratio of 2:1) for the mitigation of approximately 9.1 acres of permanent wetland impacts at the Sequatchie Valley Wetland Mitigation Site, which is 8.4 miles northeast of the project location. The wetland mitigation site would be constructed and managed by MRW Environmental LLC. TDOT has prepared a *Wetland Mitigation and Monitoring Plan* dated June 18, 2009 (see Attachment 4), which includes a *Sequatchie Valley Mitigation Project Proposal* (Appendix II) developed by MRW Properties. The plan includes restoration and enhancement activities and proposed monitoring and reporting requirements. The USACE project approval would require adherence to the provisions detailed in the report. The remaining 1.1 acres of impact would be mitigated by debiting (at a ratio of 4:1) 4.4 acres of available credit from the Coffee County Wetland Mitigation Bank. Direct impacts to wetlands would be insignificant with mitigation, as there would be a long-term net increase in wetland acreage within the watershed. There would be a negligible decrease in wetland function during the time the mitigation site matures to replace forested wetland function, but overall wetland impacts would be insignificant within the larger context of the Sequatchie Valley ecoregion and watershed.

There would be approximately 1.53 acres of temporary wetland impacts associated with construction of the roadway improvements. This would include vegetation removal, rutting, and soil disturbance from heavy equipment and vehicles and temporary alteration of hydrology. Topsoil is to be removed from all areas of temporary wetland impacts and stockpiled prior to construction and reused during restoration. Upon completion of construction activities, all temporary wetland impact areas are to be restored to preconstruction elevation. TDOT would plant the area of temporary impacts with the appropriate tree species.

With the required 2:1 mitigation ratio at the Sequatchie Valley Mitigation Site and a 4:1 ratio at the Coffee County Mitigation Bank, there would be an overall gain in wetland acreage associated with this project; thus, no negative cumulative impacts to wetlands are expected.

Floodplains

The proposed project is located opposite Battle Creek Mile 2.15. Battle Creek is a tributary to Guntersville Reservoir. The 100-year floodplain on Guntersville Reservoir is the area that would be inundated by the 100-year flood. The 100-year flood elevation for Battle Creek Mile 2.15 is 614.5 feet above mean sea level (msl). The TVA Flood Risk Profile (FRP) elevation for Battle Creek Mile 2.15 is 619.4 feet msl. At this location, the FRP elevation is equal to the 500-year flood elevation and is used to control flood damageable development for TVA projects and on TVA lands. The Town of Kimball has adopted the 100-year flood as the basis for its floodplain regulations, and any development must be consistent with those regulations.

Portions of the proposed permanent easement area for the highway improvements are located adjacent to the existing roadway and within the limits of the 100-year floodplain. Because of the relationship between the proposed improvements to the existing roadway, there is no practicable alternative but to locate the proposed roadway improvements within the floodplain. Consistent with EO 11988, highway construction is considered a repetitive action in the floodplain. The roadway elevations of both routes are above the flood stages for Battle Creek and the Tennessee River. Fill would have to be placed within the flood control storage zone to construct the roadways and ramps.

The power storage zone for Guntersville Reservoir is between elevations 593.0 and 595.0, and there is no proposed fill in the power storage zone. The flood control storage zone is between elevations 593.0 and 619.4 with an estimated fill of 71,776 cubic yards (44.5 acre-feet). This volume is greater than the net loss of 1 acre-foot of flood control storage allowable by TVA, using its standard methods for such calculations; therefore, the mitigation plan was developed.

Proposed Mitigation Plan for Flood Control Storage Loss

TDOT proposes to mitigate the fills in the flood control storage zone by excavating material, disposing of it upland, and constructing a retention basin in the TVA property in the northeast quadrant of the interchange. An average depth of approximately 3.0 feet in the retention basin would offset the calculated fill volumes. The benefits of this mitigation plan outweigh the costs since the area would offset the flood control storage fill volumes and preserve the flood control storage for the Town of Kimball. Therefore, there would be no loss of flood control storage, which would comply with the TVA Flood Control Storage Loss Guideline.

The Town of Kimball is concerned about backwater flooding of the nearby commercial area from the Tennessee River. TDOT has participated throughout the project development in discussions with the Town of Kimball, the USACE, and TVA regarding flooding issues and possible solutions that could be constructed in conjunction with the project. A flood protection study in the Kimball, Tennessee, area was conducted by Water Resources Consulting and Thompson Engineering Inc. for TDOT in May 2007 (and updated in June 2007) to alleviate flooding problems associated with commercial development along the north side of I-24 (see Attachment 5). Thompson Engineering performed hydraulic and hydrologic analyses for the project and made recommendations that included a flap gate on the 72-inch culvert under the interchange and a flood gate on the box culvert east of the interchange as flood control storage to prevent flood damages to the commercial area in the town of Kimball. It has since been determined that federal funds for the project cannot be used for the flood control structures, and no state funds are available for that purpose at this time.

Aquatic Ecology and Water Quality

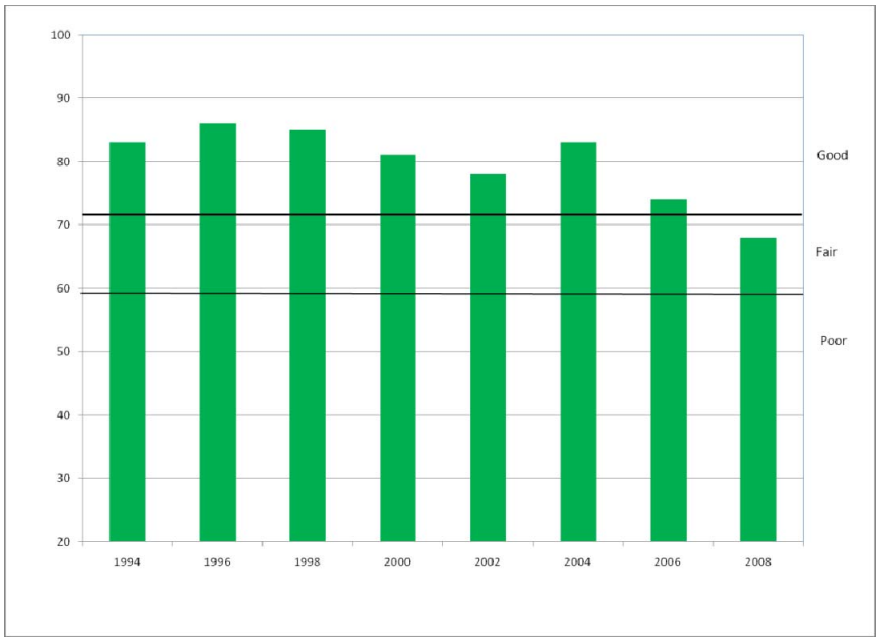
The SR 27 (US 72) at I-24 Kimball interchange is located about 1,300 feet from Battle Creek. The site is drained by an unnamed tributary that runs under the interstate just east of the interchange and continues to its mouth at Battle Creek Mile 2.2. Battle Creek enters the Tennessee River in the upper portion of Guntersville Reservoir at Tennessee River Mile (TRM) 418.6. Aquatic life could be affected by the proposed action either directly by the alteration of habitat conditions within the stream or indirectly due to modification of the riparian zone and storm water runoff resulting from construction and maintenance activities on the project site. Potential impacts due to removal of streamside vegetation within the riparian zone include increased erosion and siltation, loss of in-stream habitat, and increased stream temperatures. Other potential construction and maintenance impacts include alteration of stream banks and stream bottoms by heavy equipment and runoff of herbicides into streams. Impacts to listed aquatic species known to occur within the potentially affected watershed could occur from increased siltation entering habitats from adjacent watercourses as a result of riparian vegetation clearing and soil disturbances from roadway construction.

TVA routinely conducts monitoring of the biological health of streams in the Tennessee River drainage. Fish and bottom-dwelling (benthic) organisms are used as indicators of stream health. Analysis of the fish community is used to generate an Index of Biotic Integrity (IBI) score that describes the relative health of the stream. The IBI at the station at Battle Creek Mile 9.4 rated ”good” in 2000 and 2003, but the score decreased to the border between ”fair” and ”good” in 2008 (see table below). In a similar manner to the fish community analysis, the benthic community is also analyzed. The benthic score for Battle Creek has consistently rated ”good.” This indicates that a healthy aquatic community is present in Battle Creek. The two unnamed tributaries that would be directly affected by this project have not been assessed.

Fish IBI and Benthic Scores at Battle Creek Mile 9.4

Year	Fish IBI Score	Benthic Score
2000	50 Good	10 Good
2003	56 Good/Excellent	14 Good
2008	46 Fair/Good	11 Good

TVA has monitored ecological conditions in Guntersville Reservoir every two years since 1994 as part of its Reservoir Vital Signs Monitoring Program. The overall reservoir health rating has scored in the “good” range until 2008, when it fell to “fair” (see figure below). This is likely due to drought conditions that were present across the Tennessee River drainage at the time. The overall health ratings of TVA reservoirs are based on five ecological indicators: dissolved oxygen levels, chlorophyll concentrations, fish community, bottom life, and sediment quality. Guntersville Reservoir is sampled in the forebay (near the dam); at a midreservoir site; and in the riverine section at the upstream end of the reservoir. The riverine sampling site is at TRM 420, just upstream from the mouth of Battle Creek, where the fish community rated ”fair,” and the bottom life rated ”good.”



Ecological health scores in Guntersville Reservoir

Some of the tributaries to Battle Creek, however, are listed as not supporting their designated uses including Sweden Creek, listed for pathogen indicator bacteria from pasture and septic systems, and Tate Cove, listed for sediment from development. Project development would not change these reported water quality issues.

Under Alternative A, there would be no change to the existing condition. Under Alternative B, an increase in paved area would cause an increase in post-construction peak discharge and pollutant loading, while loss of on-site wetlands and encapsulation of streams would reduce habitat, water storage, and capacity to process pollutants. Watercourses that convey only surface water during storm events (i.e., wet-weather conveyances) and that could be affected by the proposed interchange project would be protected by standard construction-related BMPs. These BMPs are designed in large part to minimize disturbance of riparian areas and subsequent erosion and sedimentation that can be carried to streams. Construction designs for the roadways would include storm water

control features that would moderate these impacts. Local water quality and aquatic ecology impacts in the project area would be minor.

At total of 206 feet of two unnamed tributaries would be permanently impacted by placement in culverts or loss of stream length due to stream relocation. TDOT would provide compensatory mitigation for approximately 206 feet of permanent stream impacts, by making a payment of $41,200 Tennessee In-Lieu Fee Stream Mitigation Program. Use of this program would ensure that net stream loss due to this project is not a major cumulative impact to the watershed.

Terrestrial Ecology

Plants

The proposed I-24/SR 27 (US 72) improvement project occurs within the Southern Appalachians ecoregion, which stretches from Kentucky to Alabama with open low mountains containing a mosaic of forest, woodlands, and some cropland and pastures (Griffith et al. 1998). The Southern Appalachian ecoregion is divided into three subecoregions: The Cumberland Plateau, The Plateau Escarpment, and the Sequatchie Valley. The SR 27 (US 72) /I-24 interchange is found exclusively within the Sequatchie Valley, which bisects the Southern Appalachian ecoregion. The open valley floor is underlain by limestone, dolomites, and shale and provides a productive area for agriculture.

Herbaceous vegetation in the form of agricultural fields dominates Parcels 166 and 167. The remaining acreage is composed of scrub-shrub and forested wetlands as well as riparian areas along stream banks. Woody vegetation associated with riparian areas includes: American sycamore, box elder, red maple, tulip poplar, and water oak. Black willow, buttonbush, cat tails and green ash are found in scrub-shrub or emergent wetlands along with various sedges, rushes, and grasses. Because the herbaceous vegetation is common to the area, loss of herbaceous fields from the proposed highway improvements would have minor impact. Wetlands vegetation impacts would be mitigated off site through the creation of new wetlands.

Farmland

According to 2001 Land Plan, 100 percent of Parcel 166 (257.2 acres) and 14.2 percent of Parcel 167 (26.3 acres) were considered to be prime farmland. Prime farmland located in the northeast quadrant of the intersection in Parcel 167 has historically been used for hay production under an agricultural agreement. This agreement would be canceled to support the proposed highway improvements. Since the farmland is north of the interstate, adjacent to existing commercial businesses, the land has relatively little value from a farming standpoint other than hay production. Site-assessment criteria for prime farmland analyses are based largely on the impact that the proposed loss of farmland would have on farming operations and the farm service sector. The small size of the area, close proximity to commercial/industrial areas being located adjacent to the existing interstate, and highway right-of way decreases the value of land from a farming standpoint. There would be no alternative to the proposed highway improvements other than to utilize the adjacent farmland. Farmland preservation, therefore, should not be considered a viable reason to alter TVA's actions associated with the granting of the right-of-way permanent easement.

Invasive Terrestrial Species

EO 13112 defines an invasive nonnative species as any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to

that ecosystem and whose introduction does or is likely to cause economic or environmental harm or harm to human health (USDA 2007). According to the USDA list of 2006 (USDA 2007), there are no known federal noxious weeds reported from the lands around the TDOT road improvement project. Essentially, the entire proposed project is on land in which the native vegetation has been extensively altered as a result of previous land use history.

There is always the potential for the spread of exotic or invasive species when material is brought in from an off-site location. If disturbed areas are revegetated with native or nonnative noninvasive plant species and weed-free rock and soil is used for fill, this will aid in the prevention of spread and introduction of exotic invasive plant species to the area. These practices also enhance native plant diversity and wildlife habitat.

Animals

Wildlife habitats within the SR 27 (US 72)/I-24 project area are described as open, wet fields and woodlands interspersed with drainages. Herbaceous vegetation occurs throughout much of the open habitats. Wooded areas are comprised of scrub-shrub and forested wetlands as well as riparian areas along Battle Creek. While much of the wooded areas are comprised of large saplings, occasional large trees occur on the southern extent of the project site. Wildlife typically found in the project site includes species that favor damp open habitats such as red-winged blackbird, snipe, eastern cottontail, upland chorus frogs, and spring peepers. Forested areas are used intermittently by wood ducks, gray squirrels, eastern chipmunks, and winter breeding amphibians.

Under Alternative A, there would be no project-related change to the existing condition. Under Alternative B, impacts are anticipated to riparian areas and scrub-shrub wetlands present on Parcel 167 from the roadway improvements. Since the area's animal communities are common and representative of the region, loss of habitat and impacts to terrestrial wildlife resources in the vicinity of these habitats are expected to be minor and regionally insignificant. Overall wetlands acreage within the watershed would increase; therefore, cumulative impacts to the terrestrial ecology of the region as related to project activities are not anticipated.

Six caves are reported from within 3 miles of the project site, but none are located within the project site. A great blue heron colony exists on Burns Island, approximately 2 miles from the project site. There would be no impact to these resources.

Threatened and Endangered Species

The following federally listed as endangered, threatened, or candidate species have been reported to occur in Marion County: one bird (bald eagle - *Haliaeetus leucocephalus*); one fish (snail darter - *Percina tanasi*); two mammals (gray bat - *Myotis grisescens* and Indiana bat - *Myotis sodalis*); six mussels (pale lilliput - *Toxolasma cylindrellus*, dromedary pearlymussel - *Dromus dromas*, pink mucket - *Lampsilis abrupta* [=*Lampsilis orbiculata*], rough pigtoe - *Pleurobema plenum*, orangefoot wartyback - *Plethobasus cooperianus*, and white wartyback - *Plethobasus cicatricosus)*; two snails (Anthony's river snail - *Athearnia anthonyi*, and royal springsnail - *Marstonia ogmoraphe*); and four plants (large-flowered skullcap - *Scutellaria montana*, American hart's tongue fern - *Asplenium scolopendrium*, Price's potato bean - *Apios priceana*, and monkeyface orchid - *Platanthera integrilabia*). Several additional state-listed plant and animal species are known from Marion County (see Attachment 6).

No state- or federally listed species are known from historic records within the project area, and it is TVA's determination that this project would have no effect on state- or federally listed plants or animals or their habitats. Field survey of impacted areas (including characterization of the streams affected by the project) indicates that no suitable habitat for any of these species is present within areas directly affected by the project. Based on maps, photos, and knowledge of previous land use history of the project area, it is unlikely that habitat to support listed species is present (see Attachment 6).

Several federally listed aquatic species are known from the Tennessee River upstream and downstream of the mouth of Battle Creek. However, no state- or federally listed aquatic species are reported from Battle Creek. With proper implementation of BMPs to control impacts to Battle Creek, no effects on listed species occurring in the Tennessee River are anticipated. Cumulative impacts to threatened and endangered species as related to project activities are likewise not anticipated.

Cultural Resources

A historical/archaeological assessment for the proposed interchange improvements was conducted by TDOT in December 2002 (see Attachment 7). The TDOT CE review indicated that there are no structures, sites, or properties listed or eligible for listing in the NRHP. The Tennessee State Historic Preservation Officer (TN SHPO) letter dated December 16, 2002, states that the area of potential effect (APE) for this undertaking contains no cultural resources eligible for listing in the NRHP. The TN SHPO letter also stated that borrow areas outside of the proposed rights-of-way will require separate certification.

TVA reviewed the cultural resource information supplied with the SR 27 (US 72) /I-24 interchange request and notified TDOT in December 2009 that the existing archaeological assessment and associated SHPO concurrence did not consider the 14.6 acres of requested TVA land on Parcel 167. A TDOT archaeologist conducted a field assessment and determined that, due to existing disturbance and wetland soils in this tract, no historic properties would be affected by the granting of this easement or issuance of a Section 26a permit for the roadway improvements. TVA concurs with this finding. TDOT submitted a letter to the TN SHPO on February 12, 2010. The TN SHPO concurred with the finding on February 22, 2010. Therefore, there would be no direct, indirect or cumulative effects to cultural resources.

Visual Resources

The physical, biological, and cultural features of an area combine to make the visual landscape character both identifiable and unique. Scenic integrity indicates the degree of unity or wholeness of the visual character. Scenic attractiveness is the evaluation of outstanding or unique natural features, scenic variety, seasonal change, and strategic location. Where and how the landscape is viewed would affect the more subjective perceptions of its aesthetic quality and sense of place. Views of a landscape are described in terms of what is seen in foreground, middleground, and background distances. In the foreground, an area within 0.5 mile of the observer, details of objects are easily distinguished in the landscape. In the middleground, normally between 1 mile and 4 miles from the observer, objects may be distinguishable, but their details are weak and they tend to merge into larger patterns. Details and colors of objects in the background, the distant part of the landscape, are not normally discernible unless they are especially large and standing alone. The impressions of an area's visual character can have a significant influence on how it is appreciated, protected, and used.

Visual consequences are examined in terms of visual changes between the existing landscape and proposed actions, sensitivity of viewing points available to the general public, their viewing distances, and visibility of proposed changes. Scenic integrity indicates the degree of intactness or wholeness of the landscape character. These measures help identify changes in visual character based on commonly held perceptions of landscape beauty and the aesthetic sense of place.

The existing I- 24 interchange at SR 27 (US 72) is located in a predominately commercial district that borders TVA property north and south of I-24. SR 27 (US 72) is a major thoroughfare from South Pittsburgh, Tennessee, to Huntsville, Alabama, and other major cities to the west. The interchange is mainly viewed in the foreground by motorists but can be seen up to background distances from prominent peaks in all directions. These distances increase during the winter when vegetation does not obscure views from area residents and motorists along local roads. The interchange is littered with a variety of billboards and utility poles that can be seen up to middleground distances from the interstate and local roads. Directional signage, service poles, and other appurtenances contribute to the number of discordantly contrasting elements seen in the landscape. Scenic integrity is low. Scenic attractiveness is common.

The greatest impacts to visual resources would likely be temporary, unavoidable, and in the foreground during the construction period. Scenic integrity would be reduced as an increase in machinery, personnel, and equipment is seen in the landscape. Further visual disruptions would include local traffic that is slowed and takes an increased amount of time to negotiate ramps and the US 72 thoroughfare in either direction of construction activities. The use of tall equipment, such as cranes, would be seen from greater distances up to the middleground.

Post-construction, operation, and maintenance of the proposed interchange would be visually insignificant. Visual impacts to Parcel 166 (0.6 acre) would be minor when compared to the overall number of acres (257.2) allocated to the Sensitive Resource Management in this parcel. The improved interchange would be visually similar to human alterations seen in the landscape now from the parcel. The proposed TDOT improvements on Parcel 167 would be visually compatible with its current use and therefore would result in only minor visual impacts. Construction lighting and ramp lighting during operational phases would be unavoidable for safety purposes and would likely add to the brightness seen in the night sky up to background distances from the project area. However, this new lighting would be minor in an area well-lighted for commercial business during the evening hours now. Therefore, impacts from waste light would be minor.

Socioeconomic Impacts

Since Parcel 167 has been determined not suitable for Zone 5 (Industrial/Commercial) use, the proposed highway improvements would not directly reduce opportunities for economic development in the area. In fact, locating an exchange there would provide an opportunity for some business development–primarily motel/restaurant-type businesses, potentially retail, to serve travelers. However, any such minor commercial development would have very little economic impact on the county as a whole. Total nonfarm employment in Marion County was 10,374 in 2007, while manufacturing employment was 1,479. Nonfarm employment increased over the previous five-year period by 7.7 percent, while manufacturing employment declined by 9.9 percent. There would be no foreseeable negative socioeconomic impacts associated with the proposed action.

Agencies and Others Consulted

The USACE issued Joint Public Notice 09-81 on November 12, 2009, advertising the TDOT proposal. Comments were accepted for a 30-day review period ending December 13, 2009. Comments were received from the THC, the Federal Emergency Management Agency (FEMA), the TWRA, and the USFWS (see Attachment 8).

The THC TN SHPO determined that there are no NRHP-listed or -eligible properties affected by the undertaking and had no objection to proceeding with the project. The FEMA response concurred that there is no practicable alternative to locating in the floodplain and relayed design measures to minimize potential harm. TWRA expressed concerns regarding the proposed wetland impacts and mitigation and requested additional review to see if all affected wetlands have been identified. USFWS echoed TWRA concerns that the appropriate wetland impacts and required wetland mitigation would need further review.

As a result of the USACE public notice and subsequent review, TDOT, in conjunction with TDEC, identified an additional 2.1 acres of impacted wetlands and. redefined the wetland boundary. A revised USACE Public Notice 09-81A to advertise the additional wetland impacts and additional wetland mitigation was issued on February 3, 2010, for a 15-day review period ending on February 18, 2010. Comments were received from the USFWS and the TN SHPO. The USFWS requested that the USACE include a permit time frame restriction period between November 1 and March 1 to limit tree removal of trees 6 inches in diameter or greater to protect the federally listed as endangered Indiana bat. TVA's review, however, did not identify any suitable Indiana bat habitat on site. The TN SHPO letter dated February 22, 2010, stated that the project area contains no archaeological resources eligible for listing in the NRHP.

TDEC issued Public Notice 09-63 on October 7, 2009, including a request for input on the I-24 interchange project (NRS09.290). Comments were due by November 6, 2009. Due to the redefinition of the wetland boundary, a revised public notice was issued on December 16, 2009. Comments were received through January 4, 2010. TDEC issued an Aquatic Resource Alteration Permit/401 Certification on March 2, 2010.

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Attachments

Attachment 1 - Land Use 26a Application
Attachment 2 - TDOT Environmental Review
Attachment 3 - TVA Categorical Exclusion Checklist 20339
Attachment 4 - Wetland Mitigation Plan
Attachment 5 - Drainage Study Report
Attachment 6 - Endangered and Threatened Species
Attachment 7 - TDOT Cultural Review
Attachment 8 - USACE Public Notices and Responses
Figure 1 - Vicinity Map
Figure 2 - Proposed Easement Area