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Project Number: 2009-71

FINAL ENVIRONMENTAL ASSESSMENT

PROPOSED SECTION 26A APPROVAL TO KNOXVILLE UTILITIES BOARD FOR SEWER LINE AND WATER MAIN CROSSING FORT LOUDOUN RESERVOIR, TENNESSEE RIVER MILE 646.6

TENNESSEE VALLEY AUTHORITY

JANUARY 2010

The Proposed Decision and Need

The Knoxville Utilities Board (KUB) proposes to replace a section of an existing sewer line originally installed in 1947. The proposed sewer line crosses Fort Loudoun Reservoir at Tennessee River Mile (TRM) 646.6 in Knox County, Tennessee (Figure 1), at a point slightly upstream of the existing line's location. The new sewer line would consist of two ductile iron pipes (DIP) that would be installed using a conventional cut-and-cover method in a 3.5-foot-deep trench below the riverbed. A temporary emergency bypass line would be anchored on the river bottom to prevent overflow during rain events. In addition, due to planned rehabilitation of the nearby Henley Street Bridge in 2010, KUB proposes to remove the existing 16-inch water main currently affixed to the bridge and install the water main within the same trench as the proposed new sewer line. Other components of the project include the installation of two concrete manhole junction boxes on either side of the proposed crossing route and associated sewer pipes and manholes as shown in the conceptual layout (Figure 2).

The decision before Tennessee Valley Authority (TVA) is whether to issue approval under Section 26a of the *TVA Act* for the installation of the sewer line and water main crossing beneath the marked navigation channel of the Tennessee River. The proposed project involves a small area of TVA property currently under easement along Neyland Drive and would affect land over which TVA has flowage easement rights on the opposite shore. TVA is not proposing to convey any property rights to KUB. As a result, no land action is associated with the request.

Other Environmental Reviews and Documentation

The U.S. Army Corps of Engineers (USACE) determined that KUB's proposal is eligible for Section 404 Nationwide Permit No. 14 and therefore categorically excluded it. Additionally, KUB has obtained an Aquatic Resource Alteration Permit (ARAP)/Section 401 Water Quality Certification, NR0903.027, for the proposed project (Attachment 1). The USACE and TVA issued Joint Public Notice (JPN) No. 09-38 on May 18, 2009, for the proposed action (Attachment 2). Comments in response to the JPN were received from Tennessee Wildlife Resources Agency (TWRA), U.S. Fish and Wildlife Service, and the Tennessee State Historic Preservation Officer (SHPO) (see Attachment 2).

Alternatives and Comparison

TVA considered two alternatives: the No Action Alternative and the Action Alternative. Under the No Action Alternative, TVA would not issue Section 26a approval for the proposed actions. Consequently, KUB would not construct the proposed lines. Under the Action Alternative, TVA

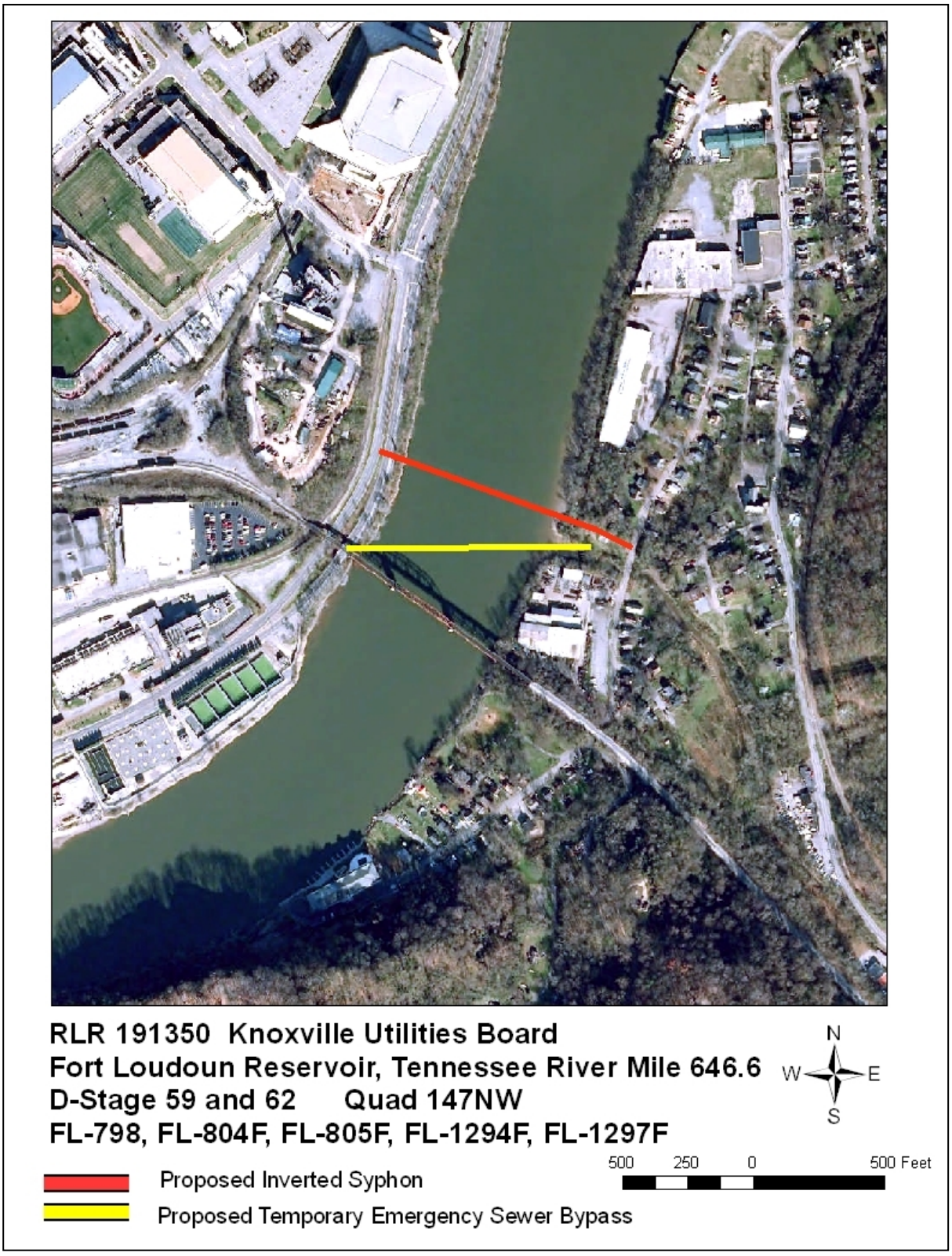

Figure 1. Project Site Map

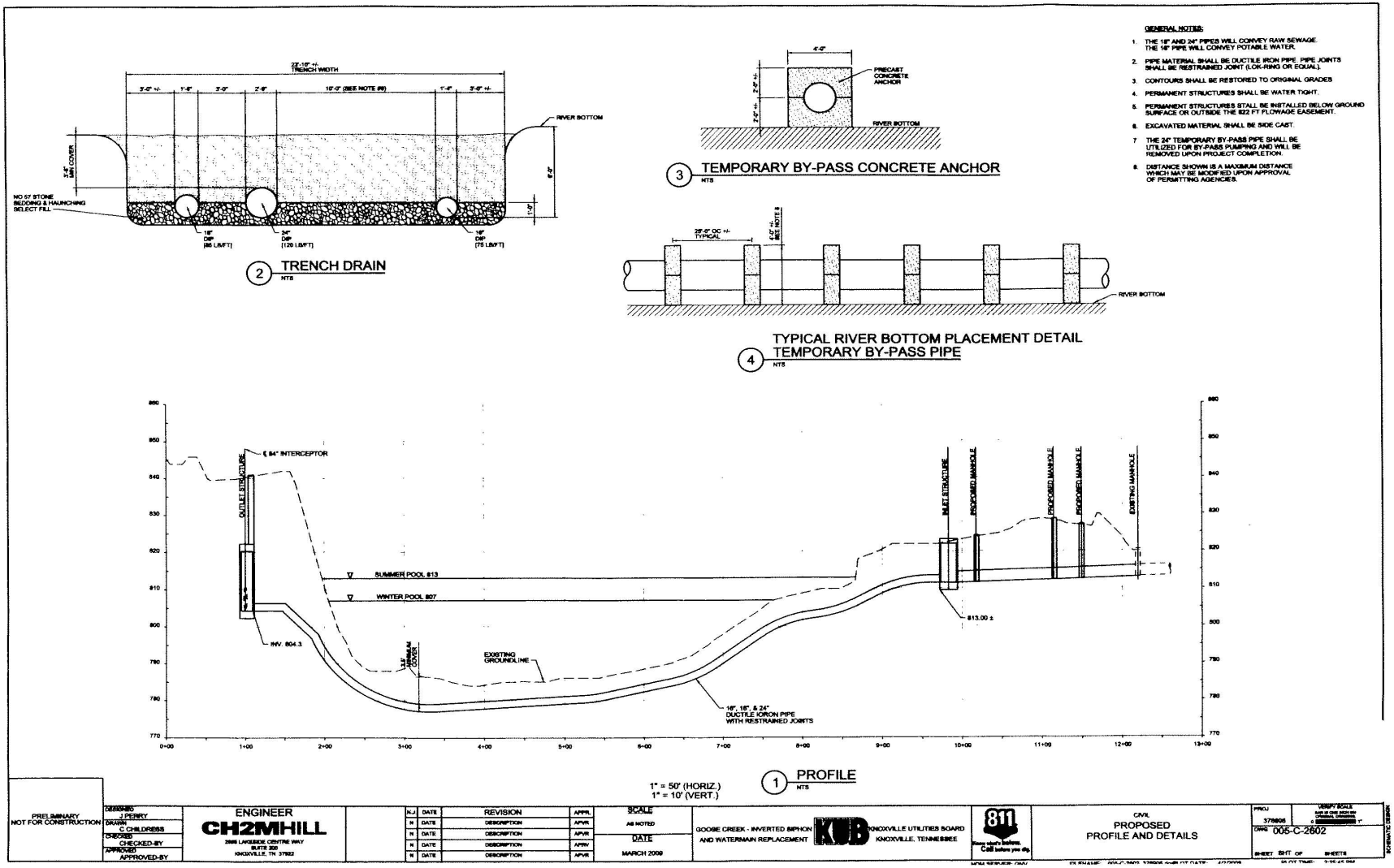

Figure 2. Conceptual Construction Layout

would issue Section 26a approval for the construction of the proposed lines, and KUB would construct the proposed sewer and water lines.

KUB considered tunnel boring, horizontal direction drilling (HDD), and cut-and-cover construction methods for implementing the proposed actions. Upon completion of an extensive geotechnical evaluation that identified subsurface voids, tunnel boring and HDD were considered impracticable alternatives. Therefore, TVA eliminated those alternatives from detailed consideration in this EA.

No Action Alternative

Under the No Action Alternative, TVA would not issue Section 26a approval for the proposed construction of the new sewer line, water main, and temporary pipeline. Alternately, KUB might withdraw its Section 26a permit request, and the project would not be constructed. The current sewer line would continue to serve area residents. The line's age, condition, and limited capacity would continue to be of concern. The risk that the existing sewer line could become unreliable or fail would continue. The water main would not be relocated from the Henley Street Bridge. Furthermore, environmental conditions in the project area would remain unchanged. Adoption of this alternative would not meet the needs of the applicant.

Action Alternative

Under the Action Alternative, TVA would issue Section 26a approval for the construction of sewer and water lines. Implementing the Action Alternative would allow for the replacement of the existing sewer line and avoid potential adverse water quality effects from its failure. The existing sewer line would remain in place and its potential for further use would be evaluated after construction of the new line. The proposed new sewer line would include two pipes: an 18-inch-diameter and a 24-inch-diameter DIP. The proposal also includes installation of one 16-inch diameter DIP water main pipe within the same trench. The three pipes would be installed beneath the riverbed using a conventional marine cut-and-cover method. The estimated total length of each pipe to be installed beneath the river is 700 feet. The proposed pipe depth is 3.5 feet (minimum) below the existing riverbed. All pipes and structures would be below ground surface or outside the existing TVA flowage easement of elevation 822 feet mean sea level. Other components within the project include the installation of two concrete manhole junction boxes on either side of the proposed crossing route and associated sewer pipes, manholes, and a 24-inch-diameter high-density polyethylene temporary pipe. The proposed temporary pipe would be placed on the bottom of the river and secured with concrete anchors. All temporary piping would be removed at the completion of the project.

Construction would be carried out by blasting and excavating a trench 23 feet wide by 6 feet deep for the three new pipes. The excavation would be conducted using a clamshell excavator mounted on a 40-foot by 80-foot crane barge. A second barge of the same size would also be used for storing materials. After blasting, the excavated material would be sidecast to the upstream side of the trench in order to minimize disturbance to the existing line located downstream of the trench. The excavated material would be used as trench backfill to restore the original riverbed contours after the pipes have been placed by crane and divers.

Best management practices (BMPs) such as placement of silt control structures would be installed prior to any soil-disturbing activities to reduce adverse impacts to a minimum. In addition, floating silt screens extending from the water surface to the reservoir bottom would be installed prior to activities. Finally, silt control measures would be left in place until sediment has visibly settled. The complete descriptions of relevant standards of the ARAP and General

Permit for Utility Crossings and the Section 26a Permit are provided as Attachments 1 and 3, respectively.

Affected Environment and Evaluation of Impacts

The proposed sewer line, water main, and temporary pipeline would cross beneath the marked navigation channel of the Tennessee River at TRM 646.6. The width of the river in the project area is about 600 feet with a maximum depth of approximately 29 feet in the main channel. The riverbed substrate consists of silt and sediment on the sloping riverbanks and primarily a native rock material in the main channel. The banks of the river in the project area consist of riprap with dispersed native shrubs and grasses.

Preliminary Environmental Review

A preliminary environmental review of the proposed project is documented in the attached categorical exclusion checklist (see Attachment 4). Based on this evaluation, TVA determined that impacts to wetlands, federally listed threatened and endangered species, natural areas, unique or important terrestrial habitat or aquatic communities, air quality, noise, navigation, transportation, and recreation would be absent or minor. No production of hazardous wastes, wastes requiring special handling and disposal, or negative social or socioeconomic impacts are anticipated. The project is not in conflict with any plan, existing land use, or zoning regulation.

This EA further evaluates the following resource areas for potential impacts: historic and cultural resources, water quality, and aquatic ecology.

Historic and Cultural Resources

Historic and cultural resources, including archaeological resources, are protected under the *Archaeological Resources Protection Act*, the *Native American Graves Protection and Repatriation Act*, and the *National Historic Preservation Act* (NHPA). Section 106 of NHPA requires federal agencies to consult with the respective SHPO when proposed federal undertakings could affect these resources.

The historic and cultural resources area of potential effect (APE) includes the sewer line route and temporary/permanent construction areas related to the sewer system, water main, and temporary pipeline installation (Attachment 5). A Phase I archaeological survey was conducted in March 2009 by the University of Tennessee (Kocis 2009), and an archaeological site (40KN317) was identified within the APE. There are no historic structures in the APE. TVA and the Tennessee SHPO agree that archaeological site 40KN317 is eligible for listing in the National Register of Historic Places. Based on the results of a comprehensive geotechnical evaluation of the subsurface, KUB has determined that avoidance of these resources is not practicable. As a result of this conclusion, TVA has determined that the proposed project would adversely affect archaeological site 40KN317.

Under the No Action Alternative, there would be no impact to historic properties or historic structures because none of the proposed actions would occur, and the area around the proposed project site would remain unchanged.

Implementation of the Action Alternative would have no impact on historic structures, but would adversely affect archaeological site 40KN317. TVA consulted with the SHPO regarding this determination. In a letter dated August 7, 2009 (Attachment 6), the SHPO concurred with TVA's determination that there would be adverse effects on this archaeological site. TVA has notified the Advisory Council on Historic Preservation regarding the adverse effect finding pursuant to

36 CFR § 800.6(a)(1). In order to complete the Section 106 process and mitigate potential impacts to archaeological site 40KN317, TVA and the SHPO have executed a memorandum of agreement (MOA) (Attachment 7). The MOA includes stipulations and a treatment plan that consist of avoidance and data recovery from site 40KN317. Execution of the MOA and implementation of its terms by TVA and KUB fulfill TVA's obligations under Section 106 of the NHPA.

Water Quality

Fort Loudoun Reservoir is classified by the Tennessee Department of Environment and Conservation for six possible uses: domestic water supply, fish and aquatic life, industrial water supply, irrigation, livestock watering and wildlife, and recreation. The existing substrate consists of rock, sand, silty clay, and fine sediment, which provide habitat for fish spawning and feeding.

TVA rates reservoir health conditions based on five ecological indicators: dissolved oxygen, chlorophyll, fish, bottom life, and sediment. Although the reservoir rated "poor" in 2007, conditions were similar to most previous years (TVA 2009a). Low ratings for chlorophyll and bottom life have consistently reduced the reservoir's overall ecological health score. However, sediment quality improved in 2007.

Previous water quality and biological studies have revealed the potential for contaminants in the area where the river bottom sediments would be excavated. The potential for contaminants is associated with former operations by the Knoxville Glove Company, located immediately upstream of the proposed action, and the Gulf Oil Corporation, which operated near the site from the 1930s to the 1970s (TVA 2006).

Because of the potential for contaminants in legacy sediment to be disturbed by the proposed action, underwater sediment samples were collected for contaminant analysis. A preliminary soils investigation completed in July 2008 (see Attachment 8) tested for potential chemical contaminants in the sediment. Twelve core sediment samples were collected using Vibracoring technology from two cross sections of the riverbed. A second sampling event using a Standard Ponar Grab sampler was attempted at four locations across the riverbed. The data analysis was based on the sediment quality guidelines developed by the National Oceanic Atmospheric Administration. The screened contaminants obtained through Vibracoring technology include the following:

- Volatile Organic Carbons (VOCs)
- Semivolatile Organic Carbons (SVOCs)
- Polynuclear Aromatic Hydrocarbons (PAHs)
- Polychlorinated Biphenyls (PCBs)
- Pesticides
- *Resource Conservation and Recovery Act* (RCRA) Metals
- Total Organic Carbon (TOCs)

In summary, the VOCs, SVOCs, PAHs, and pesticides all resulted in nondetectable amounts. PCBs and RCRA metals, with the exception of cadmium, measured below the lowest concentration at which an adverse effect is observed. The cadmium concentration was substantially below the concentration at which an adverse effect is anticipated. At these levels, the cadmium concentration is not anticipated to have an adverse effect. The findings and the analysis from the preliminary soils investigation are in Attachment 8.

The grab samples were collected near the locations of some of the sediment core sites. These samples were tested for the same constituents as before, but they were also tested for zinc. In summary, the results were consistent with the core sampling results. All constituents, with the exception of cadmium and zinc, measured below the lowest concentration at which an adverse effect is observed.

Adoption of the No Action Alternative would result in no impact from this action on the aquatic environment or to surface water quality because no change from current conditions would occur. Implementation of the Action Alternative would result in short-term minor impacts on the aquatic environment. These potential effects are described below.

Construction activities along the banks and within the river would disturb bottom sediments and aquatic life. Without proper containment methods, construction of the proposed sewer system and water main could result in adverse water quality impacts. Based on an analysis of constituents found in the impact area, TVA concludes that the contaminant levels in the sediment were substantially below the concentration at which an adverse effect is anticipated (see Attachment 8).

The proposed action along with proper implementation of BMPs, compliance with applicable environmental laws and regulations, and adherence to the provisions of required state permits (e.g., ARAP and Water Quality Certification) are expected to result in only temporary and minor surface water impacts. The relevant standards of the General ARAP for Construction and Utility Crossings and Section 26a General Standards and Conditions are contained in Attachments 1 and 3. TVA has determined that these standards would be adequate for reducing potential impacts to water quality to minor levels. Water quality would be expected to return to normal conditions after construction activities are complete.

Aquatic Ecology

Fort Loudoun Reservoir includes approximately 360 miles of shoreline and about 14,600 acres of water surface. The reservoir's fish population contains common species such as bluegill, black bass, largemouth bass, smallmouth bass, striped bass, white bass, crappie, black crappie, white crappie, channel catfish, sauger, walleye, and others. Aquatic habitat in the area has been slightly to moderately disturbed by the presence of recreational and commercial activities associated with nearby barge terminals, marinas, and community docks.

In a letter dated June 11, 2009 (Attachment 2), TWRA stated their environmental concerns regarding the proposed actions. Trench construction would be carried out by blasting and excavating a trench for the three pipelines. TWRA indicated that, with use of this method, there is a potential that the underwater blasting could cause a fish kill. TWRA indicated the applicant should be aware that if a fish kill occurs, the applicant will be responsible for damages. Furthermore, the Region IV office of TWRA requested to be informed in advance when any blasting would occur so that personnel can be on site if necessary to assess damages.

Implementation of the No Action Alternative would not impact aquatic ecology or aquatic species. However, because the existing sewer line system is deteriorating, there is potential for future unidentified adverse impacts to aquatic ecology from the possibility of seepage of wastewater due to the failure of the existing sewer line. Under the Action Alternative, installation of the sewer line system, water main, and temporary water line would likely adversely impact aquatic species and their habitats. However, the adverse impacts would be minor and temporary, as most aquatic species would return to the area after construction is complete.

Cumulative Impacts

Mitigative measures, including the application of construction-related BMPs (see below), would be included as conditions of TVA's Section 26a approval. As stated above, adoption of the Action Alternative would result in temporary and minor effects to cultural resources, water quality, and aquatic ecology. As the city of Knoxville continues to grow, commercial and recreational developments are likely to be constructed along the Knoxville waterfront on Fort Loudoun Reservoir. Many, if not all, of these developments would be subject to TVA Section 26a approval, and TVA would likely impose appropriate stipulations as conditions of approval to protect environmental resources. The upcoming Knoxville South Waterfront Project is expected to cause minor impacts to water quality and cultural resources (TVA 2009b). Likewise, the anticipated rehabilitation of the Henley Street Bridge could affect these resources. However, because appropriate safeguards would be employed during construction to avoid or reduce environmental impacts, potential effects resulting from these projects are expected to be minor and of limited duration. The proposed action and these reasonably foreseeable actions would not occur concurrently or at the same location. Therefore, considering the impacts from past actions and the anticipated effects of present and future actions, the cumulative and secondary impact of the proposed action are considered minor.

Nonroutine Mitigation Measures

In addition to adherence to the General Standards and Conditions included in TVA's Section 26a approval, including construction-related BMPs, TVA would require the applicant to implement the following nonroutine measures that would be included as additional conditions in the Section 26a approval:

- To ensure that cultural resources are properly avoided and recovered, the applicant shall comply with all of the terms of the stipulations and treatment plan outlined in the MOA before any ground-disturbing activities occur in the project site.

- To honor its request, the applicant shall notify TWRA in advance of any blasting activities occurring within the riverbed so that TWRA personnel can plan to be on site if necessary to assess damages. The applicant shall notify TVA upon completion of TWRA notification.

Preferred Alternative

TVA's preferred alternative is the Action Alternative, under which TVA would issue Section 26a approval for the proposed sewer system and water main improvements.

TVA Preparers

Kelly R. Baxter, Document Preparation and NEPA Compliance

Loretta A. McNamee, Document Preparation and NEPA Compliance

Agencies and Others Consulted

Federally Recognized Tribes
Tennessee Department of Environment and Conservation
Tennessee State Historic Preservation Officer
Tennessee Wildlife Resources Agency
U.S. Fish and Wildlife Service

References

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Tennessee Valley Authority. 2006. *City View at Riverwalk Marina Facilities Environmental Assessment. Knoxville, Tenn.*: TVA NEPA Resources, Project No. 2006-102. Available from < http://www.tva.gov/environment/reports/riverwalk/index.htm>.

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———. 2009b. *Draft Proposed Knoxville South Waterfront Public Improvements Environmental Assessment. Knoxville, Tenn.*: TVA NEPA Resources, Project No. 2008-51. Available from < http://www.tva.gov/environment/reports/s_knox_waterfront/index.htm>

Attachments

1. Permits Acquired by Applicant and Permit Terms and Conditions
2. Joint Public Notice and Agency Comment Responses
3. Section 26a General Standards and Conditions
4. TVA Categorical Exclusion Checklist
5. Cultural Resources Area of Potential Effect
6. Cultural Resources Correspondence
7. Cultural Resources Memorandum of Agreement
8. Preliminary Soils Investigation

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