



**US Army Corps
of Engineers**

Nashville District

**ENVIRONMENTAL ASSESSMENT
Open Channel Maintenance Dredging, Tennessee River Near Looney
Island, River Mile 643.0**

August 2003

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**U. S. ARMY CORPS OF ENGINEERS
NASHVILLE DISTRICT**

ENVIRONMENTAL EVALUATION

**Open Channel Maintenance Dredging
Tennessee River Near Looney Island
River Mile 643.0**

1. INTRODUCTION.

1.1. Study Authority. The Rivers and Harbors Act of July 3, 1930, ch. 847, 46 Stat. L. 927 (1930) authorized the permanent improvement of the Tennessee River to a navigable depth of nine feet at low water from the mouth to Knoxville, Tennessee. The Tennessee Valley Authority Act of 1933 (16 U.S.C. §§ 831-831ee) authorized TVA to provide a nine-foot channel in the Tennessee River from Knoxville to its mouth. Since passage of the Tennessee Valley Authority Act of 1933, the Corps of Engineers, in cooperation with TVA, has maintained navigation channels on TVA projects by performing necessary maintenance dredging operations. This division of responsibility is outlined in a Memorandum of Agreement between the Corps and TVA dated October 26, 1962. TVA is a cooperating agency for this NEPA process.

1.2. Background.

A Final Environmental Impact Statement (FEIS) covering open channel maintenance for the Tennessee River and tributaries was filed with the President's Council on Environmental Quality on March 7, 1976. The FEIS contains information concerning the Tennessee River and its watershed. Like virtually all major river systems in the United States, the Tennessee River has been altered by human activities to serve the needs of a modern, industrial society.

TVA built Fort Loudoun Lock and Dam, located at Tennessee River Mile (TRM) 602.3. The lock was opened to navigation in 1943. Fort Loudoun is the uppermost main stem reservoir on the Tennessee River and provided a navigable waterway to the Knoxville area. The Holston River and French Broad River, which meet to form the Tennessee River just upstream of Knoxville are the primary inflows to Fort Loudoun Reservoir. The proposed dredging site is located near TRM 643, which is about 5 miles downstream of downtown Knoxville, Tennessee, or about 41 miles above the dam.

The State of Tennessee has established a number of designated uses for the Tennessee River near mile 643. These uses include fish and aquatic life, drinking water supply, industrial water supply, recreation, livestock and wildlife watering, irrigation, and navigation. Fort Loudoun Reservoir is presently classed as not supporting all of these uses due to PCB contamination.

The Nashville District operates locks and maintains an open channel for navigation in 764 miles of the main stem river and tributaries in the Tennessee Valley. Open-channel maintenance activities include the periodic dredging of 15 main-stem and tributary watercourse areas. Annual maintenance dredging has been performed at an average of two different sites. Specific dredging locations and quantities to be dredged vary from year to year. The proposed action is comprised of all activities associated with open-channel maintenance of the main-stem Tennessee River near Looney Island in the vicinity of TRM 643.0 in the Fort Loudoun Reservoir.

1.3. Purpose and Need.

The Tennessee River's Looney Island is subjected to constant bed load movement resulting in recurring shoaling problems in the navigation channel that create a hazard to watercraft. The FEIS can be referred to for information on overall impacts of maintenance dredging activities on the Tennessee River. The area has been dredged repeatedly, beginning in 1979 and again in 1987, 1991, and 1995. The area was last dredged in 1998.

This Environmental Assessment (EA) evaluates the specific impacts of the proposed dredging between TRM 642.5 and 643.5 and the open water disposal of the dredged material. Removal of the material is necessary to restore adequate navigational depths to this reach of the river. Dredging would be to Elevation 796.0 feet msl, which is 11 feet below Fort Loudoun Lake's normal minimum pool of 807.0, and provides the required 9 feet of navigation depth plus 2 feet of overdepth for safety and to allow for a few years of accumulation before dredging is needed again.

1.4. Coordination. A Scoping Letter was issued to all known interested parties and agencies on February 28, 2003. A copy of this letter and all responses are included in Appendix B of this document.

1.5. Previous Studies. A Final Environmental Impact Statement titled Open Channel Maintenance, Tennessee River and Tributaries, Kentucky, Tennessee, Mississippi, Alabama and Georgia was completed in November 1975. In 1986 an Environmental Assessment for dredging near Looney Island titled Channel Maintenance Dredging Tennessee River Mile 643.0 Knox County, Tennessee was completed and a Finding of No Significant Impact (FONSI) was signed on December 15, 1986. These documents are incorporated by reference.

2. ALTERNATIVES CONSIDERED.

2.1. General. Two alternatives, No Action and Open Channel Maintenance Dredging and Disposal, have been identified and are considered in detail under this evaluation. Five additional alternatives are described and have been determined to be impractical at this time. These impractical alternatives are not considered in any further detail.

2.2. Alternative 1, No Action. A No Action decision would not allow the continued maintenance dredging of the Tennessee River. At some point, as the area continues to fill and the shoals become shallower, navigation above this point in the river would be suspended. There are currently four active barge terminals located upstream from the dredging site. Two terminals supply asphalt for paving road projects in east Tennessee and the other two terminals handle various commodities such as steel, zinc, roadway salt, sand, gravel, and coke. About 500,000 tons of commerce move on the river to and from Knoxville annually. The “No Action” alternative would also have a negative impact on the floodway because the sediment buildup is presently reducing the clear cross-sectional area of the river at the site.

2.3. Alternative 2, Open Channel Maintenance Dredging and Disposal. This action would dredge up to approximately 60,000 cubic yards of sand and silt from the Tennessee River (Fort Loudoun Reservoir) navigation channel adjacent to Looney Island (see Figures 1 and 2). A clamshell type dredge would accomplish dredging, with dredged materials being transported by dump scow to the disposal area. The navigation channel would be dredged to Elevation 796.0 feet msl, which is 11 feet below the Fort Loudoun normal minimum pool of 807.0 feet msl .

2.4. Alternative 3, Upland Disposal. This would involve construction of a confined disposal facility (CDF) for containment of dredged material on property in the vicinity of the site. The CDF is essentially a settling pond, made with earth dikes, that allows the dredged material to dry over a period of time. Excess water either flows from the pond or evaporates. Dredged material would be placed in the CDF with a suction dredge.

Construction of a CDF would require the purchase of property in the vicinity of the site. Property in this area ranges from high value single-family homes to undeveloped tracts. The costs of purchasing or leasing property, construction of dikes, and suction dredging operations would require a sizeable capital investment and are well beyond the scope of the proposed maintenance activity. Creating a CDF in the Looney Island area would prove difficult as there is no available land in the immediate area and there is little room for in river construction. Furthermore, due to the type of sediment (sand) found in the Looney Island dredge site, in-river disposal is not considered to be as harmful. As a result, upland disposal at the Looney Island site is not a practicable alternative and will not be discussed in any further detail.

Knowlville, Tennessee, United States 01 Jul 1981

USGS

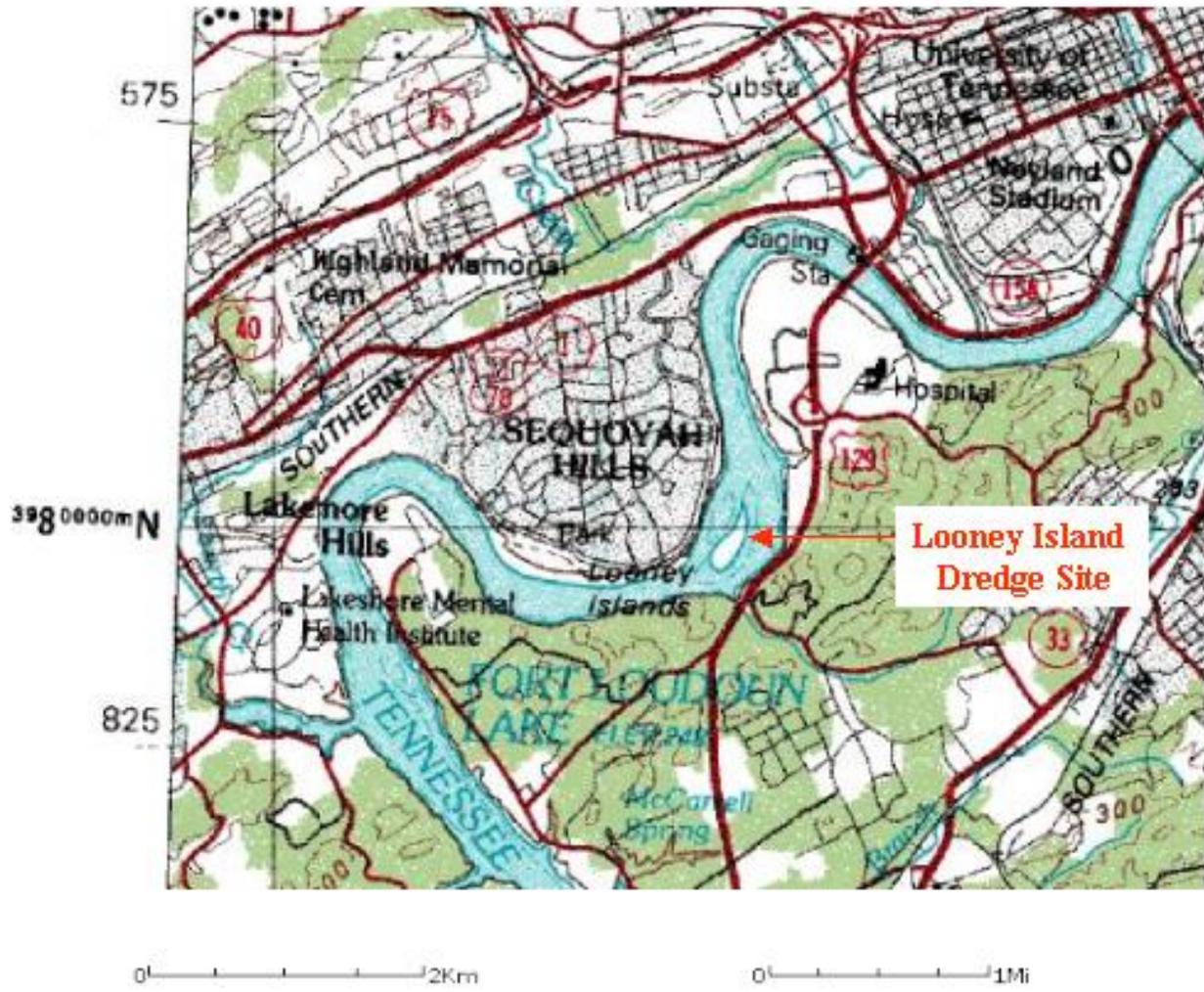


Figure 1

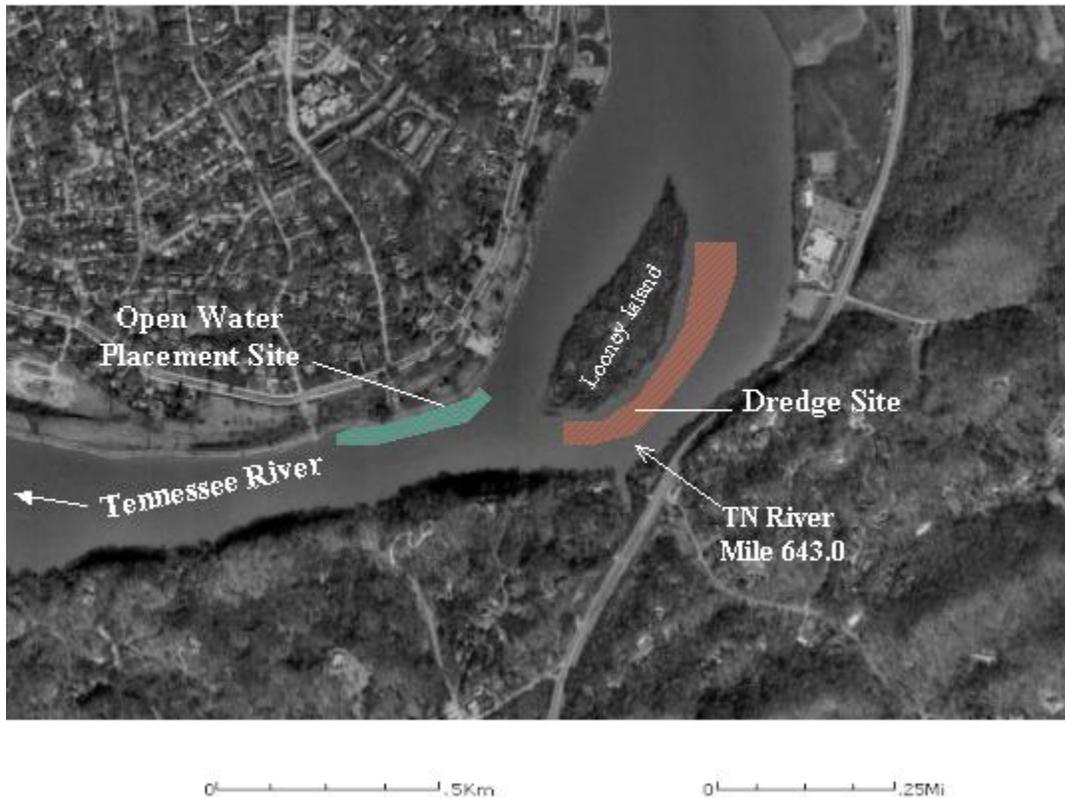


Figure 2

2.5. Alternative 4, Navigation Channel Relocation . This alternative would involve relocation of the navigation channel to the back side (not the navigation side) of Looney Island. Initial dredging would be extensive and would require transport of the dredged material to a more remote site or construction of a CDF. This alternative would cost over \$2,000,000. In addition, extensive model testing would be necessary to verify that a relocated channel would be acceptable. This testing would cost approximately \$200,000. The added costs would be well beyond the scope of the proposed maintenance activity. As a result, this is not a practicable alternative and will not be discussed in any further detail.

2.6 Alternative 5, Changing Reservoir Operations to Raise Minimum Pool Level. This alternative would eliminate the immediate need for maintenance dredging by raising the minimum pool by 2 feet. It would, however, greatly impact TVA's ability to control the flood level at Knoxville. In addition, this would only grant a few years reprieve before the area once

again required attention. As a result, this is not a practicable alternative and will not be discussed further.

2.7 Alternative 6, Open Water Disposal at a Remote Site. This alternative would involve clamshell dredging and transport of the material by dump scow to a remote site several miles downstream. At Looney Island, this would cost about \$400,000. The added costs would be well beyond the scope of the proposed maintenance activity. As a result, this is not a practicable alternative and will not be discussed in any further detail.

2.8. Alternative 7, Privatization of Channel Maintenance. Commercial towing companies could employ private dredging companies to perform channel maintenance work on the Tennessee River. However, the Nashville District, Corps of Engineers, is responsible for performing maintenance dredging in accordance with the 1962 Memorandum of Agreement between TVA and the Corps of Engineers. The Corps has access to the appropriate equipment, personnel, and historical records of previous maintenance activities. Therefore use of another dredging operation is considered impracticable and will not be further considered.

2.9 Environmental Commitments, Permits, Approvals, and Compliance.

Clean Water Act

The Corps of Engineers does not issue itself Section 404 permits, however, it does follow the same process as all other applicants. A Section 404(b)(1) evaluation would be completed and a Public Notice would be circulated for public review. Water Quality Certification in the form of an Aquatic Resource Alteration Permit (ARAP) pursuant to the Clean Water Act would be requested from the State of Tennessee to fulfill the requirements of Section 401.

National Pollutant Discharge Elimination System (NPDES) Stormwater Permit

An NPDES Stormwater permit would be required for any upland site disposals, however, as all of the upland disposal alternatives appear to not be impracticable, an NPDES Permit will not be required. No permit is required for open water disposal.

Fish and Wildlife Coordination Act

A Fish and Wildlife Coordination Act Report is required. The U.S. Fish and Wildlife Service (USFWS) has been consulted.

Cultural Resources Requirements

Section 106 of the National Historic Preservation Act requires Federal agencies having direct or indirect jurisdiction over a proposed Federal or Federally assisted undertaking to take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The State Historic Preservation Officer (SHPO) of Tennessee has been consulted with regards to this undertaking. According to the SHOP, there are no National Register of Historic Places listed or eligible properties affected by the undertaking, and has no objections to proceeding with the project.

Endangered Species Act

There are no known Federally listed threatened or endangered species in the project areas. All of the alternatives can, therefore, support a No Effect determination.

Resource Conservation and Recovery Act

All alternatives are in compliance with the Resource Conservation and Recovery Act (RCRA).

Comprehensive Environmental Response, Compensation, and Liability Act

No Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites were identified within either of the project boundaries.

Farmland Policy Protection Act

No agricultural lands or Prime and Unique Farmlands are located in the project areas.

Executive Order 11988 - Floodplain Management

None of the alternatives considered will increase the risk of a "base flood".

Clean Air Act Conformity Rule

Currently the site is in attainment regard to the National Ambient Air Quality Standard (NAAQS). None of the alternatives would have an effect on air quality.

Executive Order 12898 - Environmental Justice

None of the alternatives would have a disproportionate impact on minority or low-income populations.

2.10 Tables. Table 1 shows the environmental and economic impacts associated with each alternative. Table 2 depicts the status of the environmental commitments and necessary permits and approvals. Table 3 evaluates the occurrence of possibly significant impacts.

Table 1 - Environmental and Economic Impacts

Env. and Economic Impacts	No Action	Open Channel Dredge and Disposal
O & M Costs		Negative
Low Water Flow Regimes		
Increased Tailwater Heights		
Wildlife Resources		
Aquatic Resources	Long Term Negative	Short Term Minor Negative
Shoreline Erosion		
Economics	Negative	Positive
Wetland Impacts		
Water Quality		Minor Negative
T & E Species		
Cultural Resources		
Navigation	Negative	Positive
Farms		
Recreation	Negative	Positive
Safety	Negative	Positive
Hydropower Generation		

Table 2 – Environmental Commitments, Permits, or Approvals

Environmental Commitment, Permit, or Approval	Status
Clean Water Act	§ 401 Water Quality Certification Requested
NPDES Stormwater Permit	Not Applicable for open water disposal
Fish and Wildlife Coordination Act Report	Under Consultation with FWS
Cultural Resources Coordination	Compliant
Endangered Species Act	Compliant
Resource Conservation and Recovery Act	Compliant
CERCLA	Not Applicable
Farmland Policy Protection Act	Not Applicable
Executive Order 11988 - Floodplain Management	Compliant
Clean Air Act Conformity Rule	Compliant
Executive Order 12898 - Environmental Justice	Compliant

Table 3 – Determination of Significance of Alternatives

Env. and Economic Impacts	No Action	Open Channel Maintenance Dredging and Disposal
1) Will the alternative cause any significant effects, either beneficial or adverse?	Yes, see Items 2, 8, & 10.	No, the alternative will not cause any significant effects, either beneficial or adverse?
2) Will the proposed alternative significantly affect public health or safety?	Yes, continued shoaling would create a hazard to navigation.	No. The alternative will not significantly affect the public's health or safety.
3) Will the proposed alternative significantly affect any unique characteristics of the geographic area, such as proximity to historic or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?	No, the proposed alternative will not significantly affect any unique characteristics of the geographic area, such as proximity to historic or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.	No, the proposed alternative will not significantly affect any unique characteristics of the geographic area, such as proximity to historic or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4) Is the alternative likely to be highly controversial?	No, the alternative will maintain the current status quo.	No, the alternative will maintain the current status quo.
5) Are there any significant possible effects on the human environment that are highly uncertain or involve unique or unknown risks?	No, the alternative will maintain the current status quo.	No, the alternative will maintain the current status quo.
6) Will the alternative establish a precedent for future actions with significant effects or does it represent a decision in principle about a future consideration?	No, the alternative will maintain the current status quo.	No, the alternative will maintain the current status quo.
7) Is the alternative related to other actions with individually insignificant but cumulatively significant impacts?	No, the alternative will maintain the current status quo.	No, the alternative will maintain the current status quo.
8) Will the alternative have a significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss of significant scientific, cultural, or historical resources?	Yes, the action would eventually lead to closure of the upper end of the navigable waterway.	No, the alternative will maintain the current status quo.
9) Will the alternative adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973?	No, the alternative will maintain the current status quo.	No, the alternative will maintain the current status quo.
10) Does the alternative risk a violation of Federal, state, or local law, or requirements imposed for the protection or the environment?	Yes, failure to maintain navigation would be a violation of the Clean Water Act § 303(d) as the waterway would no longer support this designated use.	No, this alternative would not risk a violation of Federal, state, or local law, or requirements imposed for the protection or the environment?

3. ENVIRONMENTAL SETTING (Baseline Conditions).

3.1. General. Before 1900, the development of navigation on the Tennessee River was constrained by physical obstructions, by a comparatively low level of economic development in the areas served by the river, and by an undeveloped transport technology. Physical obstructions such as gravel, sandbars, and shoals were the most serious; other obstructions included rocks, ledges, and snags. Variations in stream flows and depths added to the hazards.

Between 1900 and 1933 navigation on the Tennessee River was characterized by isolated attempts to solve problems associated with specific portions of the river. When the Tennessee Valley Authority was created in 1933 it marked the beginning of a systematic approach for navigational needs. The main stem river channel from Paducah to Knoxville was completed in 1945.

Fort Loudon Lake was authorized under the Tennessee Valley Authority Act of 1933 which authorized a navigation project(s) beginning near Paducah, Kentucky, and continuing to Knoxville, Tennessee, by the construction of high lift dams with locks. Fort Loudoun Lock and Dam is the most upstream main stem navigation project authorized by this Act. The impoundment of Fort Loudoun Lake and Dam in 1943 at TRM 602.3 permanently altered the Tennessee River upstream of the dam. Aquatic characteristics such as water quality and quantity, water uses, sediment composition, aquatic and shore biota, and floodplain character were all changed by the impoundment.

3.2. Overall Forest and Vegetative Conditions. The terrestrial areas adjacent to the dredge site are developed. The area around Looney Island is located near downtown Knoxville, Tennessee and is surrounded by a mixture of residential and industrial properties. Little remains of the original forest or vegetation. Looney Island was created from dredge materials and is undeveloped and covered with a variety of hydrophytic plants and trees including sycamores (*Platanus occidentalis*), cottonwoods (*Populus deltoides*), and green ash (*Fraxinus pennsylvanica*) up to fifty or sixty feet in height.

3.3. Overall Wildlife Habitat Conditions. The areas surrounding the project site is developed. Only common urban or suburban wildlife are likely to be found along the riverbanks and landward. Looney island is heavily used as a nesting site by great blue herons (*Ardea herodias*), Canada geese (*Branta canadensis*), osprey (*Pandion haliaetus*), and other birds. However, as the project dredging and disposal areas are in open waters, no terrestrial wildlife are expected to be affected.

3.4. Water Quality. The Tennessee Department of Environment and Conservation's Division of Water Pollution Control describes the waters in Fort Loudoun Lake surrounding the project areas in the 2002 305(b) Report, The Status of Water Quality in Tennessee as not supporting all of the designated uses for that portion of the river. This is

due to unacceptably high levels of PCBs in the sediment and accumulation in fish tissue within the area. In 1986 the sediment was sampled and tested prior to dredging at the proposed location. At that time no PCBs or other contaminants were found in the samples.

In the past, other problems listed were pathogens, siltation, nutrients, and habitat alteration that impair most stream miles in this watershed. Pathogens, siltation, and nutrients have been delisted as causes for Fort Loudoun remaining on the §303(d) list. Although the habitat is still altered, it alone is not sufficient to cause the area to be listed.

On April 23, 2003 sediments were collected from the proposed dredge site. The material consisted of fine-grained material (sand) with considerable amounts of organic material (decaying plant matter). Sediment samples were analyzed for a number of semivolatile organic compounds, organic volatile compounds, pesticides, metals (including mercury), and PCBs. For all samples PCB arochlors were below the method detection or lowest quantifiable value limit. Results for all other compounds tested were indicated below the method detection limit. The exception to this was acetone, which was detected, but was reported with data qualifiers indicating it also was detected in the method blank. The conclusion here is laboratory contamination occurred and not that acetone was actually in the samples. Mercury was analyzed by the cold vapor method, enabling detections to be made in the ppb range. Mercury results indicated values below screening levels (0.1-0.15 mg/kg). Overall, metals values were screened by comparing them to various sediment quality standards found through searches on the Internet. Comparison of metals values reported indicated concentrations in the sediments that would not be problematic.

3.5. Threatened or Endangered Species. Five species of Federally listed Threatened or Endangered Species are known to reside in the area. These include the yellowfin madtom (*Noturus flavipinnis*), the orange-foot pimpleback (*Plethobasus cooperianus*), the dromedary pearlymussel (*Dromus dromus*), the peregrine falcon (*Falco peregrinus*), and the hellbender (*Cryptobranchus alleganiensis*). A survey of the area and sampling of the sediment indicate that none of the listed species are likely to be present in either the dredge or the disposal sites.

3.6. Wetlands. The project dredge and disposal sites are located in open water of Fort Loudoun Lake. Although these are jurisdictional waters of the U.S., they are not wetlands as defined in the 1987 Corps of Engineers Wetlands Delineation Manual. This delineation uses a multi-parameter approach, which requires positive evidence of three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. No jurisdictional wetlands exist at the sites.

3.7. Fish and Aquatic Life. On April 22, 2003 proposed placement areas for the dredged material were briefly examined to determine existing biological communities. At Looney Island, the primary placement site is just downstream from the island along the right descending bank. This deep area (25-40 feet) was sampled using a petite ponar grab. Substrate samples were composed of sand, mud, and small amounts of gravel.

The benthos at the dredging and disposal sites consist of organisms generally adapted to life in soft, shifting, fine-grained substrates. Aquatic worms of the class Oligochaeta are present at both sites, along with larvae of aquatic midges, the chironomids and Asiatic clams. The above organisms normally function as processors of detritus, or act as filter feeders catching suspended organic material for food. The possibility of encountering endangered big river mussels such as the orange-foot pimpleback or the dromedary pearlymussel is extremely remote due to the fine-grained nature of the substrate. The listed species of concern are known to inhabit cobble, gravel, and sand substrates. A secondary placement site for dredged materials was located on the left descending bank adjacent to a steep and bluff at near TRM 642.6. The river bottom at this location was indicated to be clean swept rock slabs and thus would be a poor placement site.

3.8. Recreation. More than two million outdoor enthusiasts visit Fort Loudoun Reservoir each year. The reservoir is known for its bass fishing, boating, and bird watching.

3.9. Environmental Justice. Executive Order 12898 requires that extensive outreach and opportunity for involvement will address concerns of all communities and that minority residents and low-income residents are not disproportionately affected by potential adverse health and environmental effects from proposed actions. The proposed project areas are open water sites in the Tennessee River, and impacts to the economy and other factors are regional in nature. Demographic information indicates no differential impact based on cultural factors.

3.10. Economics. Barges passing through the Fort Loudoun lock carried almost 570,000 tons of cargo in 2002 valued at more than \$140,000,000. This traffic provided many benefits to the region including savings on shipping costs and added jobs.

3.11. Cultural Resources. No known historical, archaeological, or other cultural resources are known to exist in the proposed project area.

3.12. Hazardous, Toxic, and Radiological Wastes. The sediment in the project areas was sampled and tested for hazardous, toxic, and radiological wastes (HTRW) in April 2003. No HTRW concerns were identified (see Section 3.5).

4. ENVIRONMENTAL IMPACTS.

4.1. General. Alternative 1, No Action, and Alternative 2, Open Channel Maintenance Dredging and Disposal, are the only identified practicable alternatives.

4.2. Overall Forest and Vegetative Conditions. The project sites are composed of open reservoir waters where no terrestrial vegetation exists. Neither the No Action nor the Open Channel Maintenance Dredging and Disposal Alternatives would affect the terrestrial forest and vegetative conditions in the areas adjacent to the proposed project areas.

4.3. Overall Wildlife Habitat Conditions. The proposed project areas are all in open water areas of the Tennessee River where no terrestrial wildlife habitat would be affected by either of the alternatives. The nesting season for the birds would be over and the birds would be scattered. Therefore, the birds would not be affected by the activities either.

4.4. Water Quality. The No Action alternative would initially have no impact, however, as the area continues to become shallower, prop wash from the traffic will constantly stir the bottom and re-release the material into the water column. As the navigation channel continues to fill it would eventually cause navigation to cease. As the water would no longer support the designated use of navigation, the water could then be relegated to the Section 303d list. Alternative 2, maintenance dredging and open water disposal, would unavoidably disturb and release sediment during dredging and disposal operations, however, this would not be expected to exceed 50 NTUs above background. Although Alternative 2 would temporarily diminish water quality, long-term impacts would be negligible.

4.5. Threatened or Endangered Species. No Threatened or endangered species or their habitat would be affected by either of the alternatives. Both alternatives, therefore, support a No Effect determination.

4.6. Wetlands. No jurisdictional wetlands exist at the sites. Therefore, no wetlands would be disturbed by either alternative.

4.7. Fish and Aquatic Life. The No Action Alternative would not affect either fish or aquatic life in the short term; however, as the navigable channel fills in the prop wash of the navigation traffic will constantly scour and disrupt the bottom dwelling organisms. Alternative 2 would cause some temporary disturbance and displacement at the dredge site and would cover any organisms present at the disposal site, however, it is anticipated that these populations would quickly recover.

4.8. Recreation. The No Action alternative would gradually see the navigation channel filled in to create a hazardous shoal. Boat passage would be particularly problematic during periods of

low water, and recreation would be somewhat restricted. The maintenance dredging alternative would see the status quo maintained.

4.9. Environmental Justice. No demographic differences based on cultural, racial, or economic factors were identified. Therefore, Executive Order 12898 is has been satisfied.

4.10. Economics. The No Action alternative would result in the gradual formation of shoals that would curtail commercial traffic in this reach of the river. This result would have far-reaching, negative economic impacts. The maintenance dredging alternative would maintain the status quo and would maintain positive contributions to the regional and national economies.

4.11. Cultural Resources. No known historical, archaeological, or other cultural resources exist in the proposed project area. Therefore, there would be no impact created by either of the alternatives.

4.12. Hazardous, Toxic, and Radiological Wastes. No HTRW elements were identified in the sediment samples taken. Therefore, HTRW is not a concern.

4.13. Cumulative Effects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the (proposed) action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions (40 CFR 1508.7)”. Council for Environmental Quality (CEQ) guidance identifies an 11-step process for evaluating cumulative effects.

The assessment can be defined as “what resource goals is the proposed action going to affect”. Effects can result from either direct-project related, indirect-project related, and independent indirect causes. Based on the public and agency scoping and review performed for the previous NEPA documents conducted for this project, the following resources have been identified as target resources within the assessment goals: aquatic resources and navigation.

The past temporal boundary for this assessment is 1943 when Fort Loudoun Lake was impounded and effectively changed the entire structure and function of the river. The future temporal boundary is approximately 50 years forward in time. The geospatial boundaries cover the Tennessee River basin for both aquatic resources and navigation purposes.

4.13.1 Cumulative Effects - Aquatic Resources. The Tennessee River, including Fort Loudoun Lake, has undergone considerable changes since TVA constructed the locks and dams in the 1940s. The Tennessee River is considered one of the most ecologically diverse rivers in the world. However, since the dams were impounded this diversity has been affected, primarily due to habitat change from a lentic to a lotic system. About a dozen fish species adapted for riverine conditions are federally listed as endangered or threatened, and about 65 other species are listed under management categories used by the states. About 30 riverine mussels have been extirpated from the Tennessee River system, and twenty-eight mussels are under federal

protection. Other invertebrates are less well known, but the Tennessee River system also claims two crustaceans and four snails under federal protection.

These changes in biodiversity of the riverine species stem largely from the habitat alterations associated with reservoir impoundment. Flow disruptions caused by dams and diversions altered normal river functions by changing water temperature and chemistry, by stopping the flow of nutrients and sediment downstream, by interfering with the upstream and downstream movement of fish and other organisms, and by covering gravel and cobble substrates with fine grained sediments.

The State of Tennessee has listed several designated uses for the river in Fort Loudoun Lake. These uses include fish and aquatic life. The fish and aquatic life have been further affected by the presence of PCBs. Tests of the accumulated sediments in the project areas were tested and found to be free of PCBs. Due to the nature of the fine-grained sand and silt sediment, different organisms are found in the material that would be removed and at the proposed disposal sites. Dredging and disposing at this site would have little effect on the overall health of the aquatic ecosystem. Dredging and disposal has occurred at this site on at least five previous occasions with little effect. It can be projected that this area would continue to require dredging every 4 to 5 years for the foreseeable future. The primary effect is that the disposal sites are becoming full and must be expanded over time.

4.13.2 Cumulative Effects – Navigation. One of the designated uses of the Tennessee River is navigation. Although the river has been used for navigation since prehistoric times, it did not reach its current potential until TVA constructed the series of locks and dams in the 1940s. Safe, reliable transportation of large or heavy quantities of goods are essential to the local and regional economy.

The navigation industry has grown since TVA built the current system of locks and dams. In 1999 about 2.3 million tons of commodities moved on the Upper Tennessee navigation system, accounting for about 6.5 percent of the entire Tennessee River System traffic. Commodities traversed an average distance of 1,400 miles and have origins or destinations in 42 congressional districts in 17 states in the South, Midwest, and Mid-Atlantic Regions. Fort Loudoun is the most upstream of the navigation dams and is the gateway to and from the Knoxville area. Fort Loudoun alone passes more than a half million tons per year.

To maintain this vital resource and the economic benefits it generates, a safe and reliable navigation channel must be maintained. Failure to maintain the system would soon lead to the effective closure of the upper portion of Fort Loudoun. This would have immediate negative impacts on the shipping industry and the infrastructure already existing, and would prevent Knoxville and the upstream reaches from accruing future benefits. As long the system is maintained it is anticipated that traffic will continue to grow slowly and will continue to contribute to the region's economy.

5. CONCLUSIONS. The No Action alternative would slowly lead to the closure of the upper reaches of the Tennessee River to navigation and would have a negative impact on the region's economy. Immediate impacts would affect the existing infrastructure as docks, watercraft, warehouses, and all of the associated equipment were abandoned. Long-term impacts would see a decrease in the potential economics of the region. Goods, which could be shipped in bulk, would become more expensive since an alternative mode of transportation such as trains or trucks would have to be used. Navigation is a designated use of the water in Fort Loudon Lake. Failure to maintain a safe and reliable navigation channel could be cause for further listing of the lake under the Clean Water Act's Section 303(d) due to impairment of navigation. No action, then, would result in a change with negative impacts.

Open channel maintenance dredging and disposal, on the other hand, would maintain the status quo. Shipping would continue as it does under current conditions and would probably slowly increase over time. This, in turn, would continue to support and grow the region's economy. Alternative 2, Open Channel Maintenance Dredging and Disposal is, therefore, the preferred action.

6. References.

Final Environmental Impact Statement - Open Channel Maintenance, Tennessee River and Tributaries, Kentucky, Tennessee, Mississippi, Alabama, and Georgia, dated November 1975, by the Nashville District U.S. Army Corps of Engineers

Environmental Assessment – Channel Maintenance Dredging Tennessee River Mile 643.0, dated November 1986, by the Nashville District U.S. Army Corps of Engineers

Environmental Assessment – Channel Maintenance Dredging Tennessee River Mile 631.8, dated November 1986, by the Nashville District U.S. Army Corps of Engineers

Chickamauga Lock Feasibility Report and Supplement 1 Final Environmental Impact Statement, dated February 2002, by the Nashville District U.S. Army Corps of Engineers

Tennessee River Fort Loudoun Lake Specifications for Dredging Looney Island Mile 643.0, dated February 1998, by the Nashville District U.S. Army Corps of Engineers

Tennessee River Fort Loudoun Lake Specifications for Dredging Post Oak Island Mile 631.7, dated February 1998, by the Nashville District U.S. Army Corps of Engineers

Appendix A

Mailing List

TENNESSEE GOVERNOR'S OFFICE
STATE CAPITOL BLDG
NASHVILLE TN 37219

TENNESSEE HISTORICAL COMMISSION
ATTN HERBERT HARPER
2941 LEBANON RD
NASHVILLE TN 37243-0442

TENNESSEE DEPARTMENT OF ENVIRONMENT
AND CONSERVATION
6TH FL LC ANNEX
401 CHURCH STREET
NASHVILLE TN 37243-1534

CHARLESTON MARINE TRANSPORT, INC.
PO BOX 375
CHARLESTON TN 37310-0375

LEAF AND CIELO MYCZACK
OFFICE OF THE RIVERKEEPER
PO BOX 90
SALE CREEK TN 37373

WGOE
162 FREE HILL RD
JOHNSON CITY TN 37615-3144

DAN LIVORSI
PIONEER LANDING
105 COWAN TOWN ROAD
BUTLER TN 37640

POSTMASTER
UNITED STATES PO BOX
ALCOA TN 37701

WBCR
PO BOX 130
ALCOA TN 37701

HONORABLE JERRY E. CROSS
TENNESSEE STATE REPRESENTATIVE
PO BOX 277 DOGWOOD RD
CARYVILLE TN 37714

MARVIN GENE CALDWELL
TENNESSEE STATE REPRESENTATIVE
530 RIVERSIDE DR
CLINTON TN 37716

CLINTON COURIER NEWS
233 N HICKS ST
PO BOX 270
CLINTON TN 37716

COUNTY EXECUTIVE
ANDERSON COUNTY COURTHOUSE
RM208
CLINTON TN 37716

MAYOR OF CLINTON
MUNICIPAL BLDG
CLINTON TN 37716

POSTMASTER
UNITED STATES PO BOX
CLINTON TN 37716

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TENNESSEE STATE REPRESENTATIVE
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GREENBACK TN 37742

WILLIAM BAIRD
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1375 APPALACHIAN HWY
JACKSBORO TN 37757

RICK KIRBY
127 CLEAR COVE COURTS
LENOIR CITY TN 37771

LENOIR CITY NEWS HERALD
PO BOX 310
LENOIR CITY TN 37771

MAYOR OF LENOIR CITY
CITY HALL
LENOIR CITY TN 37771

POSTMASTER
UNITED STATES PO BOX
LENOIR CITY TN 37771

WLIL-AM & FM
406 E BROADWAY
PO BOX 340
LENOIR CITY TN 37771

POSTMASTER
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WLOD-AM
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LOUDON TN 37774

PAT HUFFMAN
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BLOUNT COUNTY COURTHOUSE
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TENNESSEE STATE REPRESENTATIVE
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307 E HARPER AVE
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MARYVILLE TN 37804

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MAYOR OF KNOXVILLE
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WYLV
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UNITED STATES SENATE
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UNITED STATES SENATE
WASHINGTON DC 20510-4201

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UNITED STATES REPRESENTATIVE
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WASHINGTON DC 20515

HONORABLE JOHN J. DUNCAN, JR.
UNITED STATES REPRESENTATIVE
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WASHINGTON DC 20515-4202

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TN RIVER VALLEY ASSOCIATION
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A. DAVID MCKINNEY
TWRA
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NASHVILLE TN 37204

DAN SHERRY
TENN WILDLIFE RESOURCES AGENCY
ELLINGTON AGRICULTURE CENTER
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U S ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
ATTN REG BRANCH
167 N MAIN ST B202
MEMPHIS TN 38103-1894

U.S. FISH & WILDLIFE SERVICE
446 NEAL STREET
COOKEVILLE TN 38501

TENNESSEE VALLEY TOWING, INC.
3594 LONE OAK RD
PADUCAH KY 42001

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EAST TENNESSEE DEVELOPMENT DISTRICT
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5616 KINGSTON PIKE
KNOXVILLE TN 37939-2806

WKXT-TV
1100 SHARPS RIDGE
PO BOX 59088
KNOXVILLE TN 37950

SANTANA DREDGING CORPORATION
PO BOX 942
SAVANNAH TN 38372

U S ARMY CORPS OF ENGINEERS
LMKOD-F
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VICKSBURG MS 39180-0060

R&W MARINE, INC.
PO BOX 1400
REIDLAND KY 42002-1400

AMERICAN COMMERCIAL BARGE LINE
PO BOX 610
JEFFERSONVILLE IN 47131-0610

DIRECTOR
WESTERN RIVER OPERATIONS
8TH COAST GUARD DISTRICT
1222 SPRUCE ST
ST LOUIS MO 63103-2832

Appendix B
Scoping Letter
and Comments Received



DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202-1070

February 28, 2003

IN REPLY REFER TO
Project Planning Branch

To All Interested Parties:

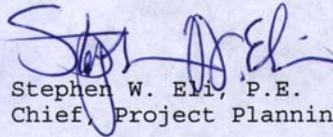
The U.S. Army Corps of Engineers, in accordance with the National Environmental Policy Act (NEPA) is preparing an Environmental Assessment (EA) to evaluate the impacts of open channel maintenance dredging in the Tennessee River in Fort Loudoun Lake adjacent to Looney Island between Tennessee River Miles 642.5 and 643.5 and adjacent to Post Oak Island between Tennessee River Miles 642.5 and 643.5. The EA will provide the basis for a decision whether to proceed with preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). By way of this letter, we are soliciting public and agency comments concerning environmental issues that should be addressed in the course of the NEPA process.

The Tennessee River's Looney Island area is subjected to constant bed load movement resulting in recurring shoaling problems in the navigation channel and forming a hazard to watercraft. The area has been dredged repeatedly, most recently in 1998.

We are soliciting public and agency comments concerning environmental issues that should be addressed in the course of the NEPA process. We encourage comments not only about the immediate project area, but also of plans or proposals for any other development that may impact or influence the project or the surrounding watershed. This letter also serves to initiate the public involvement requirements of Section 106 of the National Historic Preservation Act of 1966, as amended. As both the dredging and disposal sites have been repeatedly affected by previous operations, the Corps does not anticipate affecting any cultural or historic properties. Please submit any comments concerning environmental and cultural resource issues no later than March 30, 2003, to ensure evaluation and inclusion in the NEPA Document.

Your participation is appreciated. If you have any questions concerning this process, please feel free to contact Mr. Wayne Easterling at (615) 737-7847.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stephen W. Eli". The signature is stylized with a large initial "S" and a long horizontal stroke.

Stephen W. Eli, P.E.
Chief, Project Planning Branch



TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

March 18, 2003

Mr. Stephen Eli *8092 3/24/03*
U.S. Army Corps of Engineers, Nashville District
Planning Branch
Post Office Box 1070

Nashville, Tennessee 37202-1070

RE: COE-N, DREDGING/TRM 642.5 TO 643.5, UNINCORPORATED, KNOX COUNTY

Dear Mr. Eli:

The Tennessee State Historic Preservation Office has reviewed the above-referenced undertaking received on Tuesday, March 4, 2003 for compliance by the participating federal agency or applicant for federal assistance with Section 106 of the National Historic Preservation Act. The Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

After considering the documentation submitted, it is our opinion that there are no National Register of Historic Places listed or eligible properties affected by this undertaking. This determination is made either because of the location, scope and/or nature of the undertaking, and/or because of the size of the area of potential effect; or because no listed or eligible properties exist in the area of potential effect; or because the undertaking will not alter any characteristics of an identified eligible or listed property that qualify the property for listing in the National Register or alter such property's location, setting or use. Therefore, this office has no objections to your proceeding with the project.

If you are applying for federal funds, license or permit, you should submit this letter as evidence of compliance with Section 106 to the appropriate federal agency, which, in turn, should contact this office as required by 36 CFR 800. If you represent a federal agency, you should submit a formal determination of eligibility and effect to this office for comment. You may direct questions or comments to Jennifer M. Barnett (615) 741-1588, ext. 17. This office appreciates your cooperation.

Sincerely,

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jmb



TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER
P. O. BOX 40747
NASHVILLE, TENNESSEE 37204

March 10, 2003

Steve Eli, P.E. *SEW 3/13/03*
Chief, Project Planning Branch
Department of the Army, Corps of Engineers
P.O. Box 1070
Nashville, TN 37207-1070

Re: Scoping Comments for Proposed Open Channel Maintenance Dredging, Tennessee RM
642.5 - 643.5 Adjacent to Looney Island

Dear Steve:

The primary issue that the Tennessee Wildlife Resources Agency has for the subject proposed maintenance dredging is the location of the spoil deposition. The Environmental Assessment for this dredging should thoroughly evaluate optional sites for the dredge spoil and address the impacts of all options on aquatic life.

Thank you for requesting our views.

Sincerely,

Dan Sherry
Fish and Wildlife Environmentalist

DS:bg

cc: Mark Fagg

The State of Tennessee

AN EQUAL OPPORTUNITY EMPLOYER

SRK 26 Mar 03
PC



Office of the RiverKeeper

A biological advocate for the TENNESSEE & Cumberland Rivers

Permit Review Section

P.O. Box 90

Sale Creek, TN 37373

423-332-0748

**Comments to the Army COE
Project Planning Branch**

RE: concerning dredging adjacent to Looney Island-Ft Loudoun Reservoir-TN River:

Dear Sir:

We believe the issue of needing to periodically dredge in the river channel adjacent to Looney Island in Ft Loudoun Reservoir is really an issue of poor land stewardship and unbridled land disturbance in the Knoxville area. To date, government regulatory agencies with their attendant policies have not had the required effectiveness to prevent a heavy volume of soil to wash into the river during wet weather events.

The T DOT has been a major contributor to silt loading the Tennessee River in the Knoxville area. The COE regularly and routinely approves ALL TDOT requests for stream crossings, wetland fills, and channel relocations. Erosion controls as prescribed by the regulatory agencies are oftentimes inadequate and poorly maintained.

River shoreline owners such as UTK's agricultural farm refuse to maintain any vegetative riparian protection or runoff filtration from their cultivated fields. That they teach such inferior waterway stewardship at UTK agricultural fields hasn't boded well for our waterways. Erosion gullies in fields adjacent to the river would seem to indicate where some of the mater of the Looney Island shoals came from.

We also believe that dredging and dumping the spoils back into the river is a very short sighted, albeit cheap, solution and represents a great economic loss. This dredge spoils represents what was upland soil, perhaps even a significant amount of top soil, and is not easily or cheaply replaced. Dumping the spoils back in the river just moves the problem downstream. The extirpation of benthic species in Ft. Loudoun Reservoir is mainly due to a choking layer of silt deposited in the inundated river area, not just in the old riverbed.

This issue deserves more attention, and an comprehensive EIS should be undertaken to explore the full impacts of erosion that require periodic dredging at the subject location.

Thank you for the opportunity to submit these comments.

Sincerely, Leaf Myczack, TENNESSEE RIVERKEEPER™



REPLY TO
ATTENTION OF

Project Planning Branch

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1070
NASHVILLE, TENNESSEE 37202-1070

April 7, 2003

Mr. Leaf Myczack
Office of the RiverKeeper
P. O. Box 90
Sale Creek, Tennessee 37373

Dear Mr. Myczack:

Thank you for your response to our Scoping Letter. We agree that primary sediment sources include new construction, diminishing riparian structure and the resultant streambank erosion, agricultural practices, and increasing impervious surfaces.

Except for a limited regulatory program that permits creek and river crossings, the Corps has no authority to affect the sources of the problems. The Corps does, however, have a Congressional mandate to maintain a navigable channel in the waterway. The only feasible method of fulfilling this mission is repeated maintenance dredging.

We are looking into several alternatives for disposal of dredged material. These alternatives are No Action, open channel maintenance dredging and disposal, upland disposal, navigation channel relocation, changing reservoir operations to raise minimum pool level, open water disposal at a remote site, and privatization of channel maintenance. At Post Oak Island we are considering ringing the island with a dike to create an upland disposal area. This would fulfill our dredging disposal needs at that location for the foreseeable future. Acquiring land for an upland disposal site near Looney Island is more difficult because it is located near downtown Knoxville where land prices are high. Nevertheless, we are investigating either purchasing or leasing land from the University of Tennessee, Knoxville or possibly other owners for this purpose.

In-river disposal is desirable in some cases where material is suitable for good habitat and where we can relocate benthic communities to minimize adverse impacts.

A comprehensive Environmental Impact Statement (EIS) for operation and maintenance in the Tennessee River was completed in November 1975. The purpose of this Environmental Assessment (EA) is to address site specific conditions and provide any new or additional information and to determine if an EIS is necessary or if we can issue a Finding Of No Significant Impact (FONSI).

-2-

Your comments are being included in the EA. If you wish to make any additional comments please contact Mr. Wayne Easterling at the address above, or call him at (615) 736-7847. Again, thank you for participating in our environmental process.

Sincerely,

/ Signed /

Stephen W. Eli, P.E.
Chief, Project Planning Branch

Appendix C
Section 404(b)(1) Evaluation

**SECTION 404 (b) (1) EVALUATION
OPEN CHANNEL MAINTENANCE DREDGING AND DISPOSAL
FORT LOUDOUN LAKE, TENNESSEE
TENNESSEE RIVER MILE 643.0
KNOX COUNTY, TENNESSEE**

I. PROJECT DESCRIPTION.

a. Location. The project sites are in Fort Loudoun Lake near the City of Knoxville, in Knox County, Tennessee, between Tennessee River Miles (TRM) 642.5 (35° 55' 31"N; 83° 57', 28"W) and 643.5 (35° 55', 53"N; 83° 57', 10"W). Refer to Figure 1 for the general location map.

b. General Description. The proposed work consists of dredging lake bottom material using a barge mounted crane with a clam shell bucket and placing it in adjacent open water areas of Fort Loudoun Lake via dump scows.

c. Authority and Purpose. The Rivers and Harbors Act of July 3, 1930, ch. 847, 46 Stat. L. 927 (1930) authorized the permanent improvement of the Tennessee River to a navigable depth of nine feet at low water from the mouth to Knoxville, Tennessee. The Tennessee Valley Authority Act of 1933 (16 U.S.C. §§ 831-831ee) authorized TVA to provide a nine-foot channel in the Tennessee River from Knoxville to its mouth. Since passage of the Tennessee Valley Authority Act of 1933, the Corps of Engineers, in cooperation with TVA, has maintained navigation channels on TVA projects by performing necessary maintenance dredging operations. This division of responsibility is outlined in a Memorandum of Agreement between the Corps and TVA dated October 26, 1962. TVA is a cooperating agency for this NEPA process.

Knowlville, Tennessee, United States 01 Jul 1981

USGS

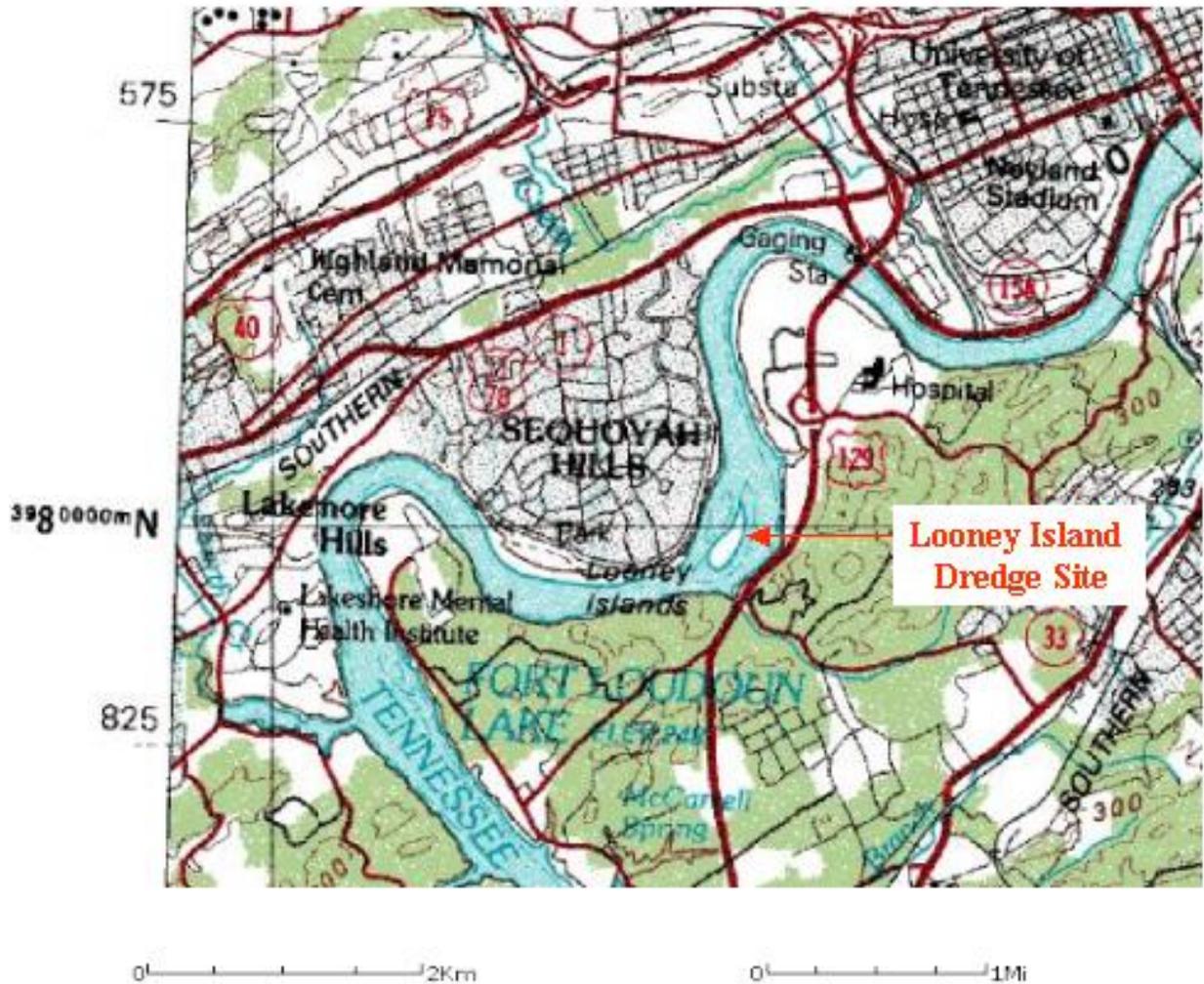


Figure 1

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. Substrate in this river reach is predominantly is sand and silt with some small gravel and was interspersed with plant detritus.

(2) Quantity of Material. The proposed work consists of dredging approximately 60,000 cubic yards of lake bottom material from approximately Tennessee River Mile 643.0.

(3) Source of Material. All dredged and fill material would come from the designated navigation channel.

e. Description of the Proposed Discharge Site.

- (1) Location. The proposed discharge site at Looney Island (TRM 643.0) is in the secondary channel along the right descending bank of the Tennessee River immediately downstream from Looney Island (see Figure 2).

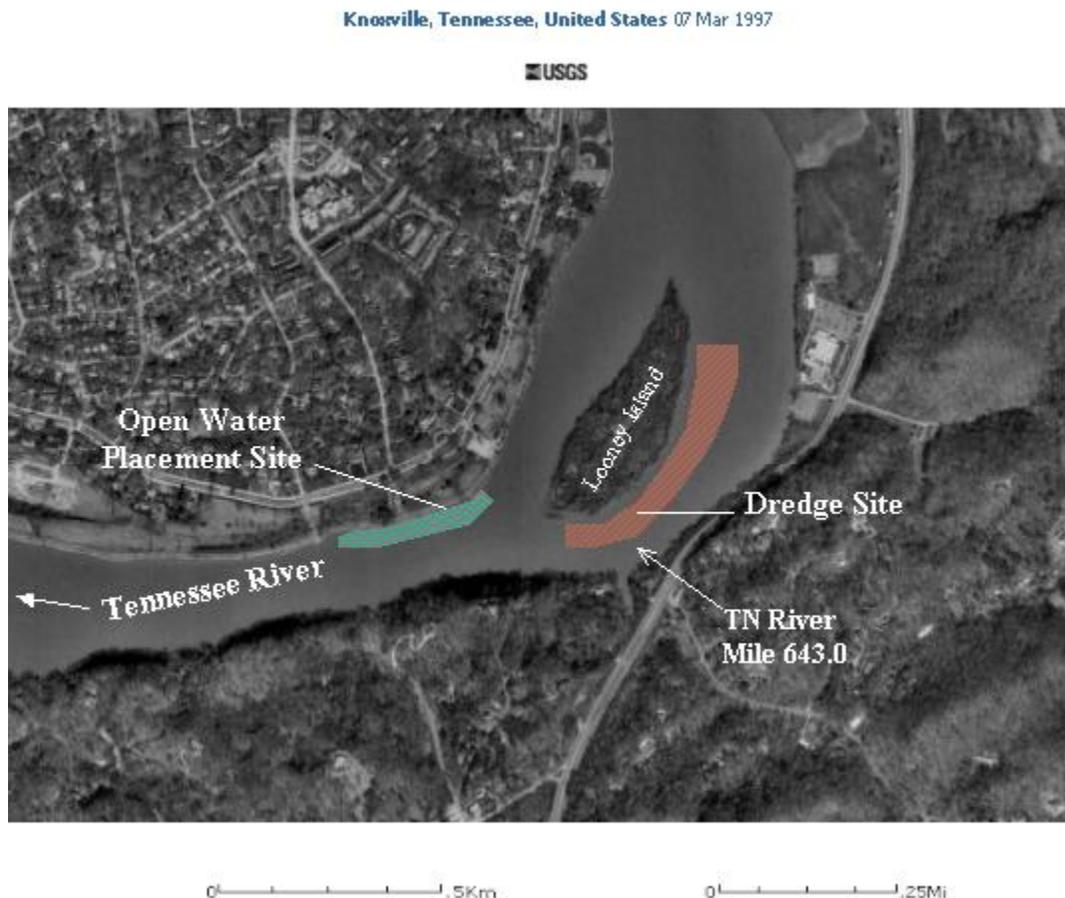


Figure 2

- (2) Size. The proposed discharge site at Looney Island (TRM 643.0) is approximately 200' wide and up to one half mile long.

(3) Type of Site. All excavated material, with the exception of *de minimus* discharge during excavation, would be placed in open water areas of Fort Loudoun Lake.

(4) Type of Habitat. The benthos at the dredging and disposal sites consist of organisms generally adapted to life in soft, shifting, fine-grained substrates. Aquatic worms of the class Oligochaeta are present at both sites, along with larvae of aquatic midges, the chironomids. The above organisms normally function as processors of detritus, or act as

filter feeders catching suspended organic material for food. The possibility of encountering endangered shellfish such as mussels or snails is extremely remote due to the nature of the substrate and degradation of upstream water quality.

(5) Timing and Duration of Discharge. All efforts will be made to dredge and excavate during the dry season (September through October) to avoid fish spawning activities that usually occur between March and August.

f. Description of Disposal Method. Sound environmental and engineering practices commonly referred to as Best Management Practices (BMPs) would be followed during all phases of project. Some sediment would unavoidably be disturbed and released during dredging and disposal, however, sediment plumes would be small and would not be expected to exceed 50 NTUs above background.

II. Factual Determinations.

a. Physical Substrate Determinations. A special water quality monitoring study was carried out concurrently with the dredging and disposal work in 1986. At that time substrate samples were analyzed for 18 chlorinated pesticides and seven subsets of PCBs. None were found in detectable quantities. In addition, the turbidity plume from the activity was sampled. Outside the immediate vicinity of the dredging operation, turbidity levels did not exceed maximum background levels. The material was fine silt and sediment and was interspersed with plant detritus.

Sediment samples from the proposed dredge and disposal sites were tested again in March 2003 with similar results. Sediment samples were analyzed for a number of semivolatile organic compounds, organic volatile compounds, pesticides, metals (including mercury), and PCBs. At all locations, PCB arochlors were below the method detection or lowest quantifiable value limit. Results for all other compounds tested were indicated below the method detection limit. The exception to this was acetone, which was detected, but was reported with data qualifiers indicating it also was detected in the method blank. The conclusion here is laboratory contamination occurred and not that acetone was actually in the samples. Mercury was analyzed by the cold vapor method, enabling detections to be made in the ppb range. Mercury results indicated values below screening levels (0.1-0.15 mg/kg). Overall, metals values were screened by comparing them to various sediment quality standards found through searches on the Internet. Comparison of metals values reported indicated concentrations in the sediments that would not be problematic. Corps of Engineers policy (CECW-OD, October 28, 1998) is that Sediment Quality Guidelines (SQGs) be used only as an initial screen for determining if higher "effects based" tiers are needed. If available SQGs and other information indicates that there is "no reason to believe" contaminants are present, no further chemical or toxicological evaluations at higher tiers are necessary. Evaluation of sediment analytical results has been conducted according to the above referenced Corps of Engineers policy. In conclusion, dredging and open water

placement of the accumulated materials downstream of Looney Island would appear not to pose any likelihood for the release of harmful quantities of pollutants into the water column. In order to minimize downstream dispersal and mixing of sediments in the water column during the dredging process, it has been recommended that operations be carried out during lowest possible flows.

(1) Substrate Elevation and Slope. The navigation channel would be excavated to ensure a minimum depth of eleven feet to elevation 796.0 feet msl. This provides the required minimum depth of nine feet and an additional two feet of overdepth for safety and efficiency.

(2) Sediment Type. Substrate in this river reach is predominantly fine sand and silt, interspersed with plant detritus.

(3) Dredged/Fill Material Movement. Excavated material would be removed by using a barge-mounted crane with a clamshell bucket. The material would be deposited by dump scows in the disposal areas.

(4) Physical Effects on Benthos. The existing benthic species are common to the region. No special effort would be made to relocate them. Most would probably survive the transit. After dredging is complete, the area should be quickly recolonized.

(5) Other Effects. The sites have been repeatedly dredged, beginning in 1979, and again in 1987, 1991, 1995. They were last dredged in 1998. No significant effects have been noted from these past operations.

(6) Actions Taken to Minimize Impacts. Proposed maintenance dredging activities would be scheduled during low flow conditions. Sediment plumes from dredging and disposal outside the mixing zone would not be expected to exceed 50 NTUs above background.

b. Water Circulation, Fluctuation, and Salinity Determinations. Current patterns, river flow and velocity and hydrologic regime would not be affected. There would be no fluctuation of pool level since fluctuations are regulated by water inflows from upstream and releases from the downstream lock and dam. No significant project-induced effects would occur during high water periods. Salinity is not a consideration. There would be no loss of floodwater storage capacity.

(1) Water. Fort Loudoun Lake maintains a regulated freshwater pool to maintain adequate navigation depths. The Tennessee Department of Environment and Conservation's Division of Water Pollution Control describes the waters in Fort Loudoun Lake surrounding the project areas in the 2002 305(b) Report, The Status of Water Quality in Tennessee as not supporting all of the designated uses for the water of the lake.

This is due to unacceptably high levels of PCBs in the sediment and accumulation in fish tissue.

(2) Current Patterns and Circulation. No significant change to the current patterns and circulation of water is anticipated.

(3) Normal Water Fluctuations. Because Fort Loudoun Lake is regulated to maintain adequate navigation depths, there is little fluctuation except during flood events. Dredging activities are not expected to produce any significant changes to the normal water fluctuations.

(4) Salinity Gradients. Not applicable. This is a freshwater system.

(5) Actions That Will Be Taken to Minimize Impacts. No impacts to circulation or fluctuation are anticipated. Therefore, no actions will be taken to minimize impacts.

c. Suspended Particulate/Turbidity Determinations. In the Tennessee River System, effects of dredging operations have been noted to dissipate as close as 300 feet downstream. Turbidity levels would be elevated locally during construction activities. Following these activities, turbidity levels should return to preconstruction level. The effect on the chemical and physical properties of the Tennessee River would be insignificant.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Some *de minimus* discharge is unavoidable during dredging and excavation. Nevertheless, the effects of the dredging and excavation operations are, therefore, expected to be localized and short-termed.

(2) Effects on Chemical and Physical Properties of the Water Column. The excavated material is composed of native sands and silts. Water chemistry, odor, taste, dissolved oxygen levels, and nutrients and any minor effects would stabilize to pre-dredging ranges quickly when dredging activities were complete. Although Fort Loudoun is noted for PCB contamination, tests of sediment samples indicate that contaminants are not present. Excavation should have little or no effect on the chemical or physical properties or the water column.

(3) Effects on Biota. The benthos at the dredging and disposal sites consist of organisms generally adapted to life in soft, shifting, fine-grained substrates. Aquatic worms of the class Oligochaeta are present along with larvae of aquatic midges, the chironomids. The possibility of encountering big river endangered shellfish is remote due to the nature of the substrate. It is anticipated that local biota would quickly return to pre-work conditions after operations cease.

(4) Actions Taken to Minimize Impacts. Best Management Practices as prescribed by the State of Tennessee would be followed during all phases of project. Sediment plumes would not be expected to exceed 50 NTUs above background. It is anticipated that the effects of suspended particulates and turbidity would be negligible. Following these activities, turbidity levels are expected to return to pre-dredging levels.

d. Contaminant Determinations. The Tennessee Department of Environment and Conservation's Division of Water Pollution Control describes the waters in Fort Loudoun Lake surrounding the project areas in the 2002 305(b) Report, The Status of Water Quality in Tennessee as not supporting all of the designated uses for the water of the lake. This is due to unacceptable levels of PCBs in the sediment and bioaccumulation in fish tissue. A special water quality monitoring study was carried out concurrently with the dredging and disposal work in 1986. At that time substrate samples were analyzed for 18 chlorinated pesticides and seven PCBs. None were found in detectable quantities. In addition, the turbidity plume from the activity was sampled. Outside the immediate vicinity of the dredging operation, turbidity levels did not exceed maximum background levels. Sediment samples were tested again in March 2003 with the same pesticide and PCB results.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. The plankton may be temporarily disturbed during dredging and disposal, however, plankton are ubiquitous and would rapidly return to pre-work levels when the project is completed.

(2) Effects on Benthos. The benthos at the dredging and disposal sites consist of organisms generally adapted to life in soft, shifting, fine-grained substrates. Aquatic worms of the class Oligochaeta are present along with larvae of aquatic midges, the chironomids. The possibility of encountering endangered species would be remote due to the nature of the substrate. It is anticipated that the biota would quickly return to pre-work conditions after operations cease.

(3) Effects on Nekton. There would be minimal effect on the nekton. It would flee the area during periods of disturbance, but would quickly return when operations are complete.

(4) Effects on Aquatic Food Web. There would be little or no effect on the food web.

(5) Effects on Special Aquatic Sites. There are no special aquatic sites present. Therefore, there would be no effect.

(6) Threatened and Endangered Species. There are no known Federally listed threatened or endangered species in the project areas and a No Effect determination can be supported.

(7) Other Wildlife. No significant adverse effects to other wildlife are anticipated. Proposed work would occur in the late summer or early fall after nesting has occurred on Looney Island and the birds have dispersed.

(8) Actions to Minimize Impacts. All possible BMPs would be enforced to minimize any adverse impacts on the environment. After dredging is complete the area to be recolonized. The proposed actions have been prepared in consultation with FWS and TWRA.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. Some de minimus discharge during dredging is unavoidable, however, care during routine dredging and disposal operations would be taken to ensure that objectionable turbidity is not generated by the activity.

(2) Determination of Compliance with Applicable Water Quality Standards. This project would meet applicable water quality standards set by the State of Tennessee.

(3) Potential Effects on Human Use Characteristics. De minimus discharges would be handled and monitored to ensure that objectionable turbidity is not generated by the activity. All negative impacts would be localized and short-term. There would be no significant negative effect on recreation, water, fishing, or any other human use characteristics.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. No adverse cumulative effects to the aquatic ecosystem of the Tennessee River has been attributed to the disposal of fill materials associated with dredging at the proposed project site.

Historically the Tennessee River was and still is one of the richest rivers in the world for aquatic biodiversity. The human community has impacted this resource over the years with a variety of point and non-point source pollutants and changes to the river's hydrology. The current system of locks and dams has altered the ecology over much of the river from a free-flowing riverine system to a slower, deeper lacustrian system. Many of the native aquatic organisms have found it difficult or in some cases impossible to adapt. It is unlikely that current conditions will change in the foreseeable future.

The construction of dams has altered the sediment bed transport that affects many aquatic resources such as mussels and fish spawning beds. Riverine habitat was converted to lacustrine habitat throughout much of the Tennessee River. Riverine mussel populations

were particularly vulnerable because of their sedentary condition. Many required specific flow conditions and gravely substrate characteristic of a riverine environment that is now limited to tailwaters on the mainstem of the Tennessee River and major tributaries. In addition, dams allowed sediment and nutrients to accrete in the impounded sections. Both point-source and nonpoint-source contaminants, particularly large amounts of sediment from construction, agriculture, and poor land management techniques, contribute to the accretion and to the nutrient loading. Regulatory programs set standards to protect water quality criteria for the designated uses of the rivers and limit point source discharges. BMP programs regulate many nonpoint sources. Due to PCB contaminants, fisheries in the area do not support either a commercial or a recreational fishery.

Gravely fish spawning habitat has been stressed over the years by the change from a free-flowing riverine system to a regulated water release program. Although the current resources appear to have adjusted somewhat to modified habitat conditions, migratory fish species appear to find it more difficult to reproduce. Migration to spawning sites upstream has been impeded by dams. Currently, the only passage available for the migratory fish is through the locks.

Approximately 6% of the Tennessee River navigation channel requires periodic dredging of the same sites. Due to the continuously shifting bed loads, these sites are not preferred nesting sites. Given the size of the Tennessee River the cumulative effects of dredging would have a negligible effect on this resource.

h. Determination of Secondary Effects on the Aquatic Ecosystem. The secondary effects on the aquatic ecosystem caused by dredging would be imperceptible.

III. Findings of Compliance or Non-Compliance with Restrictions on Discharge.

a. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation. There were no adaptations of the Section 404(b)(1) Guidelines to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem. Several alternatives were studied. None of the alternatives, including "No Action" would have a less adverse impact on the aquatic ecosystem. Alternatives that were considered but were determined impracticable are listed below.

Upland Disposal. This would involve construction of a confined disposal facility (CDF) for containment of dredged material on property in the vicinity of the site. Dredged material would be placed in the CDF with a suction dredge.

Construction of a CDF would require the purchase of property in the vicinity of the site that is predominantly residential. The costs of purchasing or leasing suitable property,

construction of dikes, suction dredging operations, and impact to the residents would require a sizeable capital investment and long term analyses that and are well beyond the scope of the proposed maintenance activity. As a result, this is not a practicable alternative.

Navigation Channel Relocation. This alternative would involve relocation of the navigation channel to the back side of Looney Island. Initial dredging would be extensive and would require transport of several times the volume of the dredged material proposed for the current project. This alternative would cost over \$2,000,000 for the project. In addition, extensive model testing would be necessary to verify that a relocated channel would be acceptable. This testing would cost approximately \$200,000. The added costs would be well beyond the scope of the proposed maintenance activity. Based on time, cost, and the extensive dredging that would be required, this is not a practicable alternative.

Changing Reservoir Operations to Raise Minimum Pool Level. This alternative would eliminate the immediate need for maintenance dredging by raising the minimum pool by 2 feet. It would, however, greatly impact TVA's ability to control flood levels at Chattanooga. In addition, this would only grant a few years reprieve before the area once again required attention. As a result, this is not a practicable alternative.

Open Water Disposal at a Remote Site. This alternative would involve clamshell dredging and transport of the material via dump scows to a remote site several miles downstream. The effects of in-water disposal would be the same regardless of location. The added costs would be well beyond the scope of the proposed maintenance activity. As a result, this is not a practicable alternative.

Privatization of Channel Maintenance. Commercial towing companies, the States, or TVA could employ private dredging companies to perform channel maintenance work on the Tennessee River. But, neither the states nor TVA can afford to pursue this alternative. The Nashville District, Corps of Engineers, is responsible for performing maintenance dredging in accordance with the 1962 Memorandum of Agreement between TVA and the Corps of Engineers. The Corps has access to the appropriate equipment, personnel, and historical records of previous maintenance activities. Therefore use of another dredging operation is considered impracticable.

c. Compliance with Applicable State Water Quality Standards. All applicable state water quality standards would be met or exceeded.

d. Compliance with Applicable Toxic Effluent Standard of Prohibition Under Section 307 of the Clean Water Act. The fill operations would not violate Section 307 of the Clean Water Act.

e. Compliance with the Endangered Species Act. Based on available information, there are no known Federally listed threatened or endangered species in the project areas and a No Effect determination can be supported.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972. Not applicable.

g. Evaluation of Extent of Degradation of the Waters of the United States.

(1) Significant Adverse Effects on Human Health and Welfare. The proposed placement of fill material would not result in any significant adverse impacts on human health and welfare, including municipal and private water supplies, recreation and commercial fishing.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems. Life stages of aquatic and terrestrial species would not be adversely affected.

(3) Significant Adverse Effects on Aquatic Ecosystem diversity, Productivity, and Stability. No significant adverse effects on aquatic ecosystem diversity, productivity, or stability would occur.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values. Recreational, aesthetic, and economic values would not be adversely affected.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the discharge on the Aquatic Ecosystem. Appropriate steps to minimize potential adverse impacts of the discharge on the aquatic ecosystem of the Tennessee River include sound engineering design. In addition, placing of the fill material would be governed by detailed specifications to prevent pollution and damage to the aquatic system as a result of dredging operations and disposal.

i. On the Basis of the Guidelines, the Proposed Disposal Site for the Discharge of Dredged or Fill Material is: specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

FINDING OF COMPLIANCE WITH CLEAN WATER ACT
SECTION 404 (B) (1) GUIDELINES
FOR
OPEN CHANNEL MAINTENANCE DREDGING AND DISPOSAL
FORT LOUDOUN LAKE, TENNESSEE
TENNESSEE RIVER MILE 643.0
KNOX COUNTY, TENNESSEE

1. No significant adaptations of the Clean Water Act Section 404 (b) (1) guidelines were made relative to this evaluation.
2. Open water disposal sites were identified for this project.
3. Dredging would not occur in a state designated mussel sanctuary.
4. Use of the selected disposal site will not harm any endangered species or their critical habitat.
5. The proposed disposal of dredged material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability and recreational, aesthetic and economic values will not occur.
6. On the basis of the guidelines the proposed disposal site for the discharge of dredged material is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

Date: _____

BYRON G. JORNS
LTC, EN
Commanding

Easterling/PM-P
Coffey/PM-P
Radley/PM-P
Smyth/OC
Day/PM
Phillips/DE-S
Warren/XO
Shelton/DDE
Jorns/DE

Appendix D
Section 404 Public Notice

