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Environmental Assessment

Floodplain Strip Adjoining the Boeing Property

OR0031043

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1.0 Introduction

The National Environmental Policy Act (NEPA) of 1969, as amended, requires Federal agencies to assess the environmental consequences potentially associated with their proposed actions (USC 4321-4347). It is the policy of the U.S. Department of Energy (DOE) to follow the letter and spirit of NEPA; to comply fully with the regulations of the Council on Environmental Quality (40 CFR Parts 1500-1508), and act in accordance with DOE implementing Procedures 10 CFR Part 1021. It is also the Department's policy to perform actions in a manner so as to avoid or minimize potential harm to or within affected floodplain and wetlands in accordance with 10 CFR Part 1022, E.O. 11988 and E.O. 11990.

This Environmental Assessment (EA) reviews the potential environmental consequences associated with the proposed action of conveying a strip of floodplain adjacent to the Boeing Property to a proposed developer as the future owner of the Boeing Property.

The floodplain strip is on the Clinch River at the western city limits of Oak Ridge, in Roane, County, Tennessee, and borders the Boeing Property on three sides. As a matter of note, the Boeing Property has also been locally referred to as the "Segment O" Property. However, in this EA it will be identified as the "Boeing Property." The floodplain strip is situated across the Clinch River from the East Tennessee Technology Park (ETTP; formerly known as the K-25 Plant) in an area known as Campbell Bend. The Boeing Property and the floodplain strip are north of the Oak Ridge Turnpike (Tennessee State Route 58, Gallaher Road). Figure 1 shows the location of the floodplain strip in relationship to the City of Oak Ridge, Tennessee and other DOE facilities in the vicinity. This land comprises the low-water line inward to the Boeing Property as identified on Figure 1. The floodplain strip totals about 182 acres. The area is situated between the waters of Roberts Branch west of the Highway 58 bridge, and Johnson Creek. Appendix A contains maps depicting the property proposed for transfer. Section 3.0 of this EA describes the environmental attributes of this property.

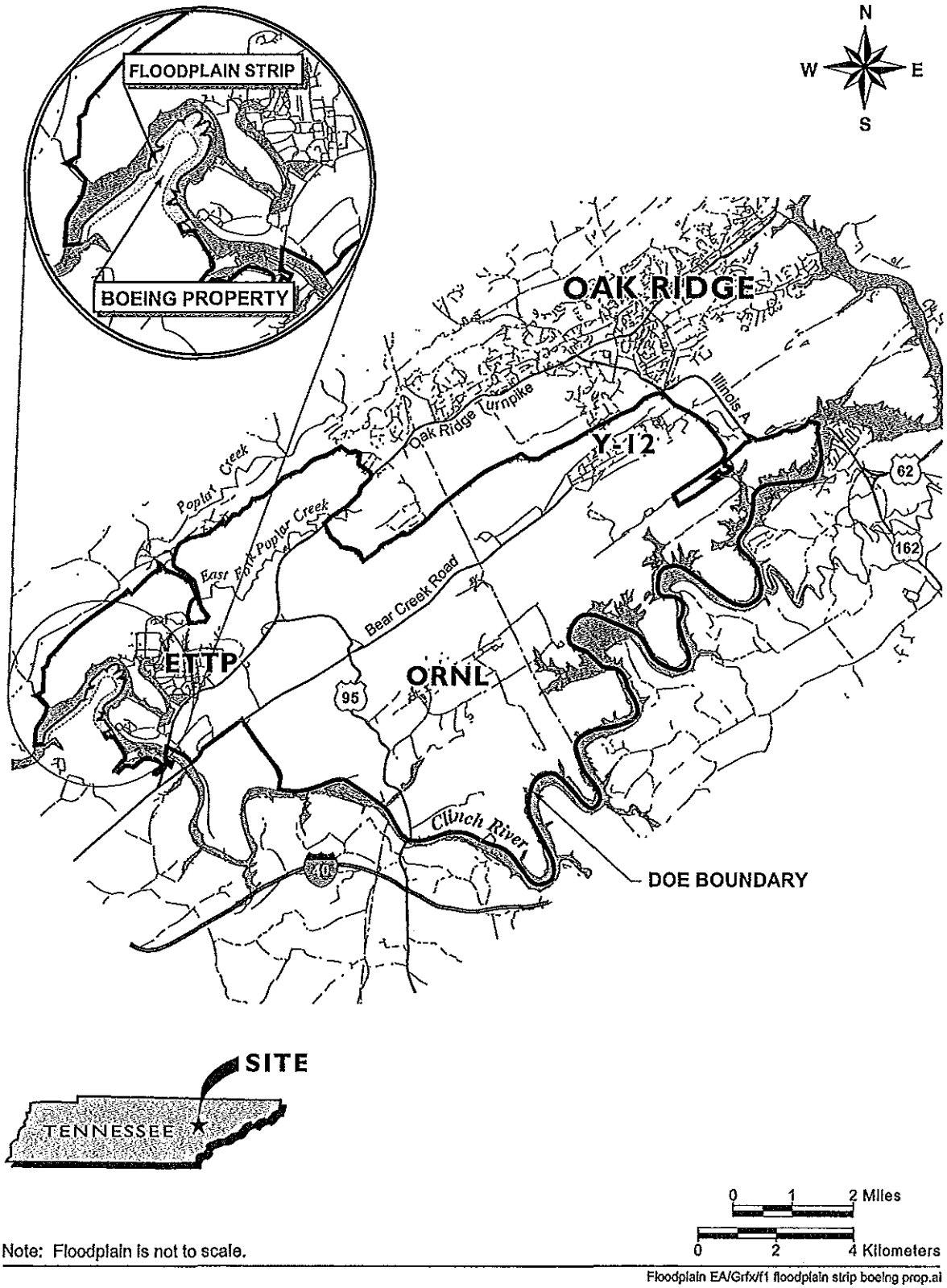

Figure 1. Floodplain Strip and Abutting Boeing Property.

1.1 Historical Perspective

The Federal government during World War II, as part of the Manhattan Project, acquired the land that now comprises the Boeing Property (about 1,217 acres). The Atomic Energy Commission (AEC) acquired the bordering floodplain strip from the Tennessee Valley Authority (TVA) in 1959. TVA, however, retained certain easement rights to the property below the 750-foot contour level on the Clinch River.

In 1987, DOE conveyed the Boeing Property to the City of Oak Ridge. On the same date the City conveyed the land to Boeing Tennessee, Inc. In 1987, prior to conveyance to the City of Oak Ridge, DOE issued a Finding of No Significant Impact (FONSI) based on an EA that was prepared for the *Sale of Segment O of the Oak Ridge Reservation to the City of Oak Ridge, Tennessee* (DOE/EA-0320, 1986). Boeing's project for the property was eventually canceled.

DOE's 1987 quitclaim deed to the City contained certain restrictions for development of what was to become the Boeing Property. DOE had determined that economic development, as it related to the self-sufficiency program, consisted of industrial development only. Subsequent to that determination, however, the parameters of economic development through the self-sufficiency program were expanded to include commercial and residential development. In November 1999, the previous residential restrictions on the Boeing Property were abrogated with the provision that all groundwater use on the property was prohibited.

In February 2000, the Oak Ridge City Council voted to rezone the Boeing site for mixed-use development. Previously, the property had been zoned for industrial uses only. Public participation was sought as part of the Boeing Property rezoning process and several members of the public provided input at the City Council meetings.

Additional information regarding the self-sufficiency program, previous DOE land transfers in the Oak Ridge area, and the land transfer process can be found in the *Environmental Assessment and FONSI for Lease of Parcel ED-1 of the Oak Ridge Reservation by the East Tennessee Economic Council* (DOE/EA-1113, 1996).

1.2 Purpose and Need for Action

DOE was contacted by the Boeing Corporation to consider conveyance of the floodplain strip adjacent to property owned by the Boeing Corporation. Boeing had provided a developer with an option to purchase its property. Due to the location and size of the floodplain strip (which is noncontiguous to the Oak Ridge Reservation) DOE determined that it had no programmatic need for the property, and that it was therefore appropriate to consider release of the property from federal ownership. In recognition of the potential economic benefits to the region of further development, DOE agreed to consider conveyance of the floodplain

strip for development along with other alternatives. The purpose of Environmental Assessment is to form the basis of any decision with respect to conveyance of the floodplain strip and to inform the public.

1.3 Scope and Organization of the Environmental Assessment

This EA conforms to the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) implementing the National Environmental Policy Act of 1969, DOE NEPA Implementing Procedures (10 CFR 1021), and DOE Floodplain/Wetlands Environmental Review Regulations (10 CFR 1022).

A "sliding-scale" approach is the basis for analysis of impacts of the Proposed Action and its alternatives. That is, certain aspects of the action have a greater potential for causing adverse environmental impacts; therefore, they are analyzed and discussed in greater detail in this EA than those aspects with little potential for impact. The resource areas analyzed in this EA include the following:

- Air Quality. DOE assessed the impacts of the Proposed Action and alternatives on the quality of air in the site area.
- Geology and Soils. Because the Proposed Action involves disturbance of soil for improvements on the floodplain strip, DOE assessed the potential impacts of these activities on geology and soils.
- Socioeconomics/Environmental Justice. Because the Proposed Action involves economic development, DOE assessed socioeconomic impacts and environmental justice.
- Land use and aesthetics. DOE assessed the potential impacts of the Proposed Action on the land use and aesthetics of the floodplain strip.
- Floodplain and wetland values. Because the Proposed Action involves the potential use of floodplain and wetland areas, DOE assessed the potential impacts of limited improvements within the floodplain strip on intrinsic floodplain/wetland values.
- Cultural and archaeological sites. Previous surveys have identified archaeological sites on the floodplain property. Two sites eligible for inclusion in the National Register for Historic Places will be excluded from any transfer action.

- Sensitive ecological areas. DOE assessed the potential to impact threatened and endangered species or ecologically important habitats.

- Public health. The State of Tennessee performed radiological surveys in the vicinity of the Boeing Property and DOE has conducted environmental investigations in Watts Bar Reservoir and on the floodplain strip. The potential health impacts associated with any residual radiological contamination in the vicinity of the floodplain strip were assessed and based on the State's report and available DOE data.

Section 2.0 of this EA describes the Proposed Action and its alternatives. Section 3.0 describes the affected environment. Section 4.0 presents an assessment of potential environmental consequences related to the Proposed Action and alternatives. Section 5.0 discusses potential management practices and deed restrictions that would be enforced upon transfer of the property. A wetland delineation and floodplains assessment for the floodplain strip has been conducted, and can be found in Appendix A of this EA. Appendix B provides information from the State of Tennessee's radiological survey, DOE groundwater sampling, and the Section 120(h) assessment conducted pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Appendix C provides correspondence from agencies consulted through the NEPA process. Appendix D provides the methods and results of the endangered bat biological assessment that was conducted on the floodplain strip as part of this EA. Appendix E presents a summary of comments received on the draft EA during the public comment period, and Appendix F presents significant excerpts from the provisions to be addressed in the conveyance document (quitclaim deed).

This analysis is focused on the potential impacts of converting the floodplain strip to private uses. Because the mixed-use development of the Boeing Property may take place regardless of the conveyance of the floodplain strip, the NEPA process does not require a detailed study of the impacts of this mixed-use development on the floodplain strip. However, this EA does consider the indirect effects of mixed-use development of the upon the adjoining floodplain strip. These potential impacts are discussed in concert with impacts on the floodplain strip as cumulative impacts in Section 4.9.

2.0 Proposed Action and Alternatives

2.1 Proposed Action

The Proposed Action is for DOE to convey a strip of floodplain adjoining the Boeing Property to the abutting landowner. The Proposed Action requires a decision by DOE and would be implemented to avoid or minimize potential harm to or within the affected floodplain and wetlands.

For purposes of this conveyance, the floodplain strip from the low-water line inward to the Boeing Property totals about 182 acres of land. The area is designated as Campbell Bend and is situated on the waters of Roberts Branch, Johnson Creek, and other minor tributaries of the Clinch River.

2.2 Alternatives

DOE assessed five alternatives involving the floodplain property abutting the Boeing Property.

The first alternative is the Proposed Action, which is conveyance of the property to the abutting landowner for unrestricted use. Alternatives two and three involve conveyance of the floodplain strip to entities other than the adjoining landowner. Alternative four involves DOE's retention of the land while conveying an easement to the abutting landowner. The fifth alternative is No Action. Development of the Boeing Property may occur regardless of the alternative chosen for the adjacent floodplain strip. Again, any impacts from the alternatives below will be evaluated in concert with impacts associated with the potential development of Boeing Property as cumulative impacts in Section 4.9.

Alternative 1 – Conveyance to the Abutting Landowner for Unrestricted Use

Under this alternative, DOE would convey the floodplain property to the owner of the Boeing Property. The owner would permit residents to use the property for recreational use and improvements consistent with the *Segment O Master Plan* (ORLC, 1999).

Improvements to the floodplain property could include the following:

- Placement of a limited number of natural surface walking paths and paved surface roads to facilitate access to the waterfront in a few select locations, also benches and picnic tables.
- Removal of fallen timber and excessive undergrowth in selected locations to improve waterfront views and mountain vistas (ORLC, 2000).

- Long-term uses could include the development and installation of TVA-authorized floating boat docks for residents and associated small buildings and trails (ORLC, 2000a).

- A community-use marina could possibly be developed, most likely near the bridge crossing the Oak Ridge Turnpike.

Alternative 2 – Conveyance of the Property to TVA

Under this alternative, DOE would convey the floodplain strip to TVA. It is likely that the property would remain undeveloped and TVA would be responsible for future management of the shoreline. However, TVA currently has a flowage easement over the entire parcel that provides TVA with broad restrictive rights for use of the land by others. The abutting landowner could negotiate with TVA for use of the property described in Alternative 1, but would be subject to TVA regulations and permitting.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County

Under this alternative, DOE would convey the floodplain property to either the City of Oak Ridge or Roane County. Although potential improvements to the floodplain strip under this alternative have not been specified by the City of Oak Ridge or Roane County, the property would likely be used as green space, and improvements to the property would be similar to those for Alternative 1.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to the Owner of the Boeing Property.

Under this alternative, DOE would remain the owner of the floodplain strip and could issue easements for necessary utilities and infrastructure over the floodplain strip. Any easements granted would first be subject to appropriate environmental review and could be subject to whatever restrictions DOE deemed appropriate at its discretion.

Alternative 5 – No Action.

Under this alternative, DOE would not convey the floodplain property and would retain ownership of the property. The Federal government would continue in its ownership and jurisdictional control of the property.

2.3 Summary of Potential Environmental Impacts by Alternative

This section summarizes the potential environmental consequences of the Proposed Action and its alternatives. Section 4.0 profiles the potential environmental impacts by resource issue and alternative.

Once the floodplain strip is transferred to the abutting landowner, it would no longer be under the control of DOE. All subsequent use of the land would be independent of DOE except for any restrictions specified in the quitclaim deed. Therefore, for the purposes of this EA, impacts that are associated with DOE's proposed conveyance and transfer of the land or that are anticipated to occur within the floodplain strip are described as direct impacts. Impacts resulting from actions undertaken by the owner of the abutting Boeing Property are described as indirect impacts through potential Boeing Property development.

Sections 4.1 through 4.8 provide information on those resource areas that could require some action on DOE's part to assure compliance with Federal law, even though the potential impacts are expected to be small. Section 4.9 summarizes the cumulative impacts, primarily those associated with the Proposed Action.

A summary of the impacts of the five alternatives, including the No Action Alternative, is presented in Table 1. The table provides a summary of both direct impacts and the indirect impacts associated with development of the Boeing Property, as well as cumulative impacts, where applicable. Table 1 focuses on resources that have the greatest potential to be affected, even though the potential impacts are expected to be small. The Boeing Property is discussed because in most cases development and use of the Boeing Property would affect the environment of the floodplain strip regardless of ownership. Other than the removal of 182 acres of natural undeveloped land from Federal control, no DOE missions or facilities are impacted or require relocation.

Table 1. Summary of Potential Environmental Impacts by Alternative

Resource Area	Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use	Alternative 2 – Conveyance of the Property to TVA	Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County	Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to Owner of Boeing Property	Alternative 5 – No Action
Air Quality	Emissions from both improvements on the floodplain and preparation of the Boeing Property for construction would be short term, sporadic and localized and be minor.	Potential impacts would be less than those described for Alternative 1, as the property would likely remain undeveloped. Also, potential impacts to air quality would likely be similar to Alternative 1 if TVA granted use of the property to the abutting landowner.	Potential impacts would be similar to those described for Alternative 1, especially if boat docking facilities were constructed.	Potential impacts would be similar to those described for Alternative 1, especially if installation of boat docking facilities was allowed.	The absence of improvements would result in little or no impacts on air quality under this alternative. Potential impacts would be similar to those described for Alternative 1, associated with development of the Boeing Property.
Geology and Soils	Some erosion may occur in the floodplain strip due to improvements such as hiking trails, a marina, and limited vegetation removal to open up views. Cumulative impacts associated with development of the Boeing Property could be expected but would be minor. The Oak Ridge Erosion Control and Stormwater Management Ordinance would apply.	Minor impacts would be expected, which would be associated with development of the Boeing Property. The Oak Ridge Erosion Control and Stormwater Management Ordinance would apply on the Boeing Property.	Minor impacts would be expected, which would be associated with development of the Boeing Property and the installation of hiking trails and other green space-related improvements, or possibly boat docking facilities. The Oak Ridge Erosion Control and Stormwater Management Ordinance would apply.	Impacts would be similar to Alternative 1. However, the installation and use of potential long-term improvements such as boat docks could be restricted, which would result in diminished impacts to soils.	Minor impacts would be expected, which would be associated with development of the Boeing Property. The Oak Ridge Erosion Control and Stormwater Management Ordinance would apply on the Boeing Property.
Land Use and Aesthetics	Recreational use of the floodplain strip could increase because of the close proximity of potential residences on the Boeing Property. The floodplain strip would remain generally undeveloped, with the exception of some limited improvements. Additional but minor impacts to aesthetics could occur if boat docks or a marina were constructed. Cumulative impacts on aesthetics due to the development on the Boeing Property could occur.	Minor impacts would be expected, which would be associated with development of the Boeing Property unless TVA granted use of the floodplain strip to the abutting landowner. In this case potential impacts would be similar to those for Alternative 1.	Minor impacts would be expected, which would be associated with development of the Boeing Property. The floodplain strip would remain undeveloped, with the exception of some limited improvements for green space recreational use, or possibly boat docking facilities.	DOE could issue and manage easements for necessary utilities and infrastructure over the floodplain property, resulting in the same impacts to aesthetics described for Alternative 1. The installation and use of potential long-term improvements such as boat docks could be encumbered, which would result in diminished impacts to aesthetics. Cumulative impacts on aesthetics due to development on the Boeing Property could occur.	Minor impacts would be expected, which would be associated with development of the Boeing Property.
Socioeconomics and Environmental Justice	Some positive benefit could be accrued because the transfer would add value to the adjoining property. If boat docking facilities or a marina was constructed, they would likely further enhance the value of the abutting property. No disproportionate effects on minority or low income populations are expected.	Lots on the Boeing Property may not appreciate in value to the extent of Alternative 1 due to the absence of water access from the floodplain strip for potential Boeing Property residents. No disproportionate effects on minority or low income populations are expected.	Lots on the Boeing Property may not appreciate in value to the extent of Alternative 1 due to the absence of water access ownership on the floodplain strip for potential Boeing Property residents. Potential Boeing residents would, however, have access to green space-related recreation on the floodplain strip. No disproportionate effects on minority or low income populations are expected.	Impacts similar to those described under Alternative 1 are likely. The installation and use of potential long-term improvements such as boat docks could be restricted, which would result in diminished economic value of the adjoining property. No disproportionate effects on minority or low-income populations are expected.	Lots on the Boeing Property may not appreciate in value to the extent as Alternative 1 due to the absence of water access from the floodplain strip for potential Boeing Property residents. No disproportionate effects on minority or low income populations are expected.
Floodplain and Wetland Values	Potential impacts to the floodplain and wetlands are expected to be minimal. Any boat dock or marina installation would be subject to the TVA Section 26(a) permitting process and would ensure compliance with applicable guidelines. If impacts to wetlands could potentially occur in the future, the	Some limited erosion and runoff associated with development of the Boeing Property could occur.	Some limited erosion and runoff associated with development of the Boeing Property could occur. Erosion and runoff from passive recreational improvements (e.g., hiking trails or boat docking facilities) would be negligible.	Impacts would be similar to those under Alternative 1, especially if installation of boat docking facilities was not restricted.	Some limited erosion and runoff associated with development of the Boeing Property could occur.

Resource Area	Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use	Alternative 2 – Conveyance of the Property to TVA	Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County	Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to Owner of Boeing Property	Alternative 5 – No Action
	related activities would also be subject to U.S. Army Corps of Engineers wetlands regulations (33 CFR, Sections 320 through 330, as amended). The potential creation of lawns, landscaped areas, and gardens on the Boeing Property, however, could result in some increased but limited runoff; cumulative impacts would be minor.				
Ecological Resources	Discernible, direct impacts to the ecological resources of the floodplain strip, including Federally endangered species, are likely to be minimal. Long-term benefits to fish population could result from the installation of boat docks, which can provide habitat. The overall biological diversity and productivity of the site area would be reduced locally due primarily with development on the Boeing Property.	Biodiversity on the site area would be reduced from development of the Boeing Property. The increased presence of humans and domestic animals could occur.	Biodiversity on the site area would be reduced from development of the Boeing Property. The increased presence of humans and domestic animals could occur.	Impacts would be similar to those under Alternative 1, especially if installation of boat docking facilities was not restricted. Biodiversity on the site area would be reduced from cumulative impacts mainly associated with development of the Boeing Property.	Biodiversity on the site area would be reduced from development of the Boeing Property.
Cultural and Archaeological Resources	Cultural and archaeological resources eligible for inclusion in the National Register of Historic Places would remain under Federal control. However, access by the public to cultural resources could increase from use of shoreline and other improvements, which could result in cumulative impacts from further increased use and development on the Boeing Property. Increased access could result in possible destruction and damage to resources, vandalism, or unauthorized collection of materials and artifacts.	Cultural and archaeological resources eligible for inclusion in the National Register of Historic Places would remain under Federal control. However, access by the public to cultural resources could increase from use of shoreline and other improvements, which could result in cumulative impacts from further increased use and development on the Boeing Property. Increased access could result in possible destruction and damage to resources, vandalism, or unauthorized collection of materials and artifacts.	Cultural and archaeological resources eligible for inclusion in the National Register of Historic Places would remain under Federal control, but increased public access could result in possible destruction and damage to resources, vandalism, and unauthorized collection of materials and artifacts.	Impacts would be similar to those under Alternative 1, especially if installation of boat docking facilities was not restricted.	Cultural and archaeological resources would remain under Federal control and impacts would be less than those for Alternative 1, 2, 3, or possibly 4, but the potential for negative impacts could increase due to inadequate surveillance and greater opportunity for public access. These impacts could include unintentional destruction or damage to resources, vandalism, and unauthorized collection of materials and artifacts.
Public Health	No discernable health effects would be expected because human use of the potentially contaminated areas would be minimal. Assuming an individual lived year-round at the most contaminated location, the estimated annual external dose would be less than the State and DOE exposure limit of 100 millirem per year.	No discernable health effects would be expected because human use of the potentially contaminated areas would be minimal.	The impacts would be similar to those described for Alternative 1, especially if boat docking facilities were constructed.	Impacts would be similar to those under Alternative 1, especially if installation of boat docking facilities was not encumbered.	No discernable health effects would be expected because human use of the potentially contaminated areas would be minimal.

3.0 Affected Environment

Section 3.0 provides baseline information for understanding the potential environmental impacts associated with conveyance of the floodplain strip. More specifically, this section describes the existing setting and conditions of the natural and man-made attributes of the property. The information presented emphasizes (1) air quality (2) geology and soils, (3) socioeconomics/environmental justice, (4) land use and aesthetics (5) floodplain and wetland values, (6) cultural and archaeological sites, (7) ecologically sensitive resources, and (8) public health. Each of these issues is interrelated and can influence how the property is transferred and ultimately used.

For the purposes of this focused EA, the term "site" specifically refers to the 182-acre floodplain strip located along the Clinch River adjacent to the Boeing Property. The term "site area" includes the floodplain strip and the Boeing Property as a whole.

For detailed information on the Boeing Property and a more comprehensive discussion of the environment in the Oak Ridge Area and on DOE's Oak Ridge Reservation (ORR), several other environmental reports may be consulted. The Boeing Property was the subject of an environment impact report completed in 1981, *Environmental Impact Report, Coal to Gasoline Facility, Oak Ridge, Tennessee* (Tennessee Synfuels Associates, 1981) and provides detailed discussions of the attributes of that site. This document was followed by a draft DOE environmental impact statement in 1982, *The Proposed Sale of Segment O of the Oak Ridge Reservation for Development by Tennessee Synfuels Associates* (DOE/EIS-0094D). As previously mentioned, DOE prepared an Environmental Assessment, *Sale of Segment O of the Oak Ridge Reservation to the City of Oak Ridge, Tennessee* in 1987. The environment of the Oak Ridge area and the DOE Oak Ridge Reservation is described in the *Environmental Assessment and FONSI of Parcel ED-1*, as previously cited, and the *Final Environmental Impact Statement, Construction and Operation of the Spallation Neutron Source* (DOE/EIS-0247, 1999a). In 1998, TVA prepared an environmental impact statement on its *Shoreline Management Initiative: An Assessment of Residential Shoreline Development Impacts in the Tennessee Valley* (TVA, 1998). This information provides information on Watts Bar Reservoir, of which the potentially affected portion of the Clinch River is a backwater. The following information presented in Section 3.0 was excerpted from one or more of these documents, unless otherwise noted.

3.1 The Environmental Setting and Broad Site Attributes

The floodplain strip is currently a part of DOE's Oak Ridge Reservation's (ORR) 34,424-acre ownership. The floodplain strip covers approximately 5 miles of shoreline along the Clinch River. The width of the floodplain strip, from the water's edge at normal pool levels to the 750-foot contour, varies from about 100 feet at approximately River Mile 12.5 to just over 3,000 feet at Roberts Branch. The average width of the floodplain strip is about 650 feet. The floodplain strip addressed herein includes the land from the low-water line inward. The Clinch River drains into the Tennessee River and is part of Watts Bar Reservoir. TVA's Watts Bar Dam is located on the Tennessee River channel near Spring City, Tennessee, about 50 river miles southwest of the site.

The nearest DOE facility to the floodplain strip is the East Tennessee Technology Park (ETTP), which is across the Clinch River to the east. The *Preliminary Master Land Use Plan* for ETTP (DOE, 1999) shows the Boeing Site and the bordering floodplain strip. Figure 2 shows the property designated as a "Biodiversity Preserved Natural Area," an element of the ORR National Environmental Research Park (NERP). For information on the NERP program see http://www.esd.ornl.gov/facilities/nerp/. Figure 2 also shows the location of the floodplain strip in relation to ETTP.

3.2 Air Quality

The ORR is part of the southeast climatological region of the United States and may be broadly classified as humid continental. A moderate continental forest climate with mild, cool winters and warm, humid summers characterizes the region. Details on local climate and severe weather patterns can be found in the *Spallation Neutron Source EIS* (DOE, 1999a).

The prevailing wind directions in the site area reflect the northeast-southwest ridge orientation of the southern Appalachian Mountains. In general, the winds out of the northeast are weaker, about 7 miles per hour (mph), than southwest winds, which average about 11 mph (TSA, 1981). The State of Tennessee has adopted the National Ambient Air Quality Standards (NAAQS), and the Tennessee Department of Environment and Conservation (TDEC) has also adopted regulations to guide the evaluation of hazardous air pollutants and toxics to specify permissible short- and long-term concentrations. Oak Ridge is in an Air Quality Control Region classified as an "attainment" area for the six NAAQS criteria pollutants (DOE, 1999).

Since there is no currently available ambient air quality data specific to the Boeing Property or the adjacent floodplain strip, the ambient air quality data for the nearby ETTP is most representative of the air quality at the site area. Detailed information on ETTP's 1998 ambient air quality and ETTP air monitoring program can be found in the *Oak Ridge Reservation Annual Site Environmental Report for 1998* (ORNL, 1999).

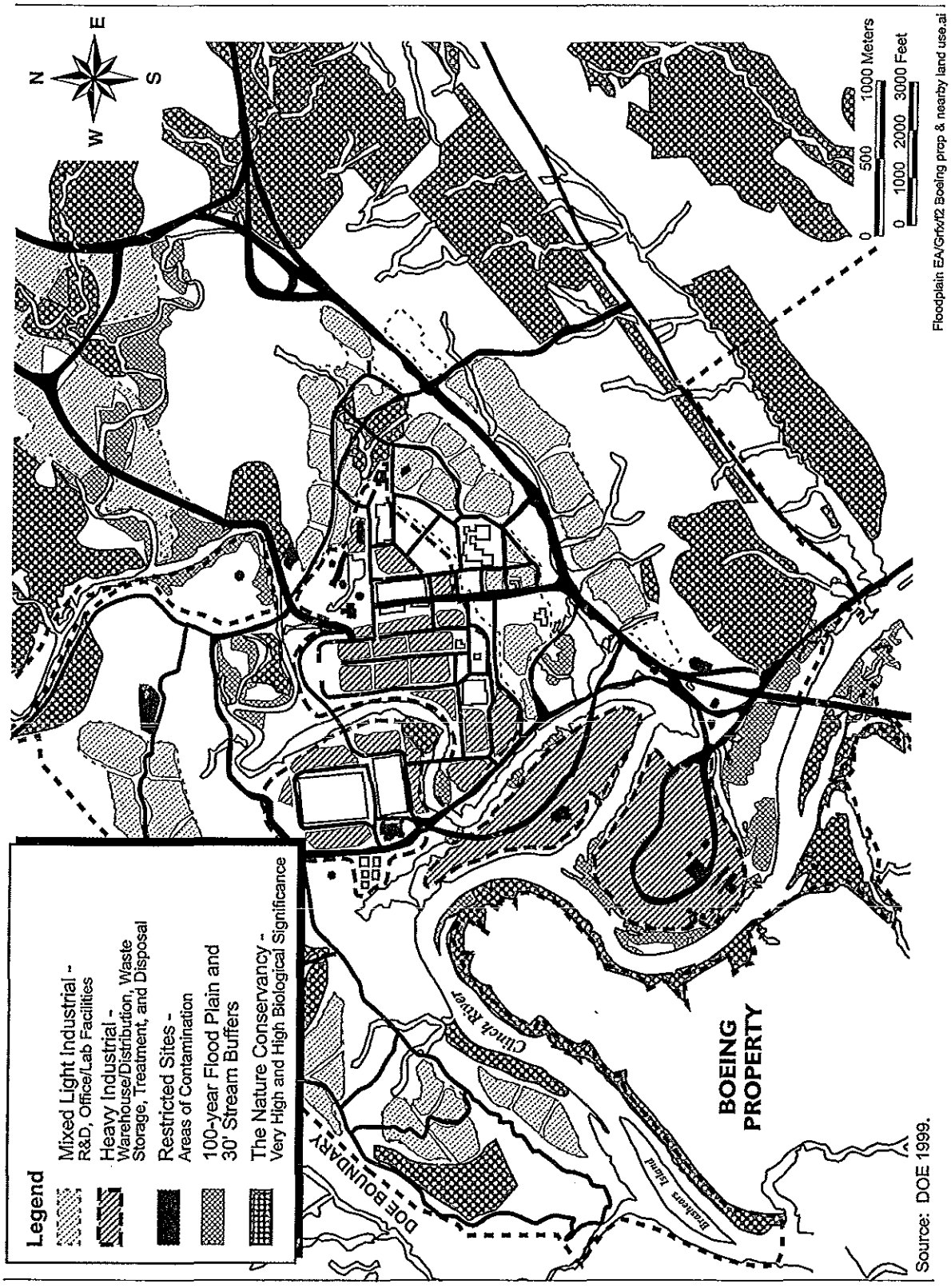

Figure 2. Boeing Property and Nearby Land Use.

Air quality data were generated from nine ambient air and/or perimeter air monitoring stations located around the ETTP facility. For the purposes of this EA, air quality data generated from the air monitoring stations located closest to the Clinch River were considered to reflect the air quality at the site. According to the environmental report, no standards were exceeded. Sampling results assessing specific ETTP activities' impact on air quality show that the ETTP did not have any impact of concern on local air quality (ORNL, 1999).

3.3 Geology and Soils

The site area is located in the Valley and Ridge Physiographic Province of eastern Tennessee. Four ridgelines cross the site area in a northeast to southwest direction with the site area positioned in Black Oak Ridge Valley to the north and west, and Pine Ridge to the east and south. The site's elevation varies from about 741 feet at the edge of the Clinch River (at normal summer pool level) to about 975 feet at the top of Pine Ridge at the southern end of the site. A geologic map of the site area is included as Figure 4 in Appendix B.

Hard limestone bedrock underlies most of the northwesterly two-thirds of the site area and somewhat softer bedrock of sandstones and shales characterize the geology in the southeasterly one-third, beneath Pine Ridge and adjacent areas. The limestone shows evidence of dissolution by surface and groundwater activity resulting in a large number of surface depressions and sinks. Previous investigations indicate the existence of some voids within the limestone bedrock (TSA, 1981). The parent materials for the soils on the ridges are sandstone and hard shales. Soft shales and limestones intermixed with clay, along with colluvium from the upland slopes, form the parent material in the valleys. The soils are generally shallow over the shale and sandstone and very deep over the dolomitic limestone. Due to the clayey and the loamy texture, erosion potential is low for these soils, except on slopes without adequate vegetative cover (TVA, 1998).

3.4 Land Use and Aesthetics

The floodplain strip is forested, with small open areas or clearings. Mixed hardwoods, mature pines, and pine plantations dominate the site area. The vegetation in the floodplain strip is typical of vegetation found on poorly drained floodplain soils. Rare cedar barrens are scattered throughout the site area (none are present on the floodplain strip). In 1986, DOE entered into agreements with the Tennessee Department of Conservation and the City of Oak Ridge to protect the cedar barrens (DOE, 1987). In 1996, approximately 500 acres in the site area were logged; 150 acres in the Campbell Bend area were subsequently reforested.

A high-voltage TVA transmission line traverses the middle of the site area oriented northeast to the southwest. Light duty roads provide some limited

access around the site. A one-mile stretch of the entry road off of Highway 58 was paved in 1998. On the East Side of the site area near River Mile 13 is an abandoned stone quarry. In addition, two excavated areas exist on the southern end of the Boeing Property near the entrance.

Public access to the site property is restricted because the site lies within the boundaries of the ORR, but this restriction is loosely enforced. Individuals, trespassing on the property, have been known to use the area for horseback riding, hiking, off-road driving, hunting, fishing, camping, and swimming (HIPS, 2000). The site has no developed recreation areas and no use statistics are available. Currently there are no fixed or floating docks or piers that extend from the site area into the adjacent floodplain or into the Clinch River.

Because the floodplain area is located immediately adjacent to and along the natural shoreline of the Clinch River, the floodplain strip is considered "scenic" for its natural beauty in conjunction with the aesthetic values of the Clinch River. From some locations on the site, structures across the Clinch River at ETTP can be seen.

3.5 Socioeconomics and Environmental Justice

Socioeconomic Setting. The ORR is located in Roane and Anderson Counties in East Tennessee, mostly within the corporate limits of the City of Oak Ridge (1996 population 27,742). The City of Knoxville (1996 population 167,535) is about 15 miles east. Although most ORR employees live in these two cities, the workforce is drawn from a 15-county area. The two major communities in Roane County are Kingston (1996 population 4,395) and Harriman (1996 population 7,006). The *Spallation Neutron Source EIS* provides detailed information on the socioeconomic and demographic environment of the Oak Ridge area.

Since 1991, unemployment has increased in the region. In 1997, the unemployment rate for Anderson County was 4.2 percent, while the unemployment rate for Roane County was 6.0 percent. In more recent years, due to budget cuts and mission changes, DOE committed about $49 million in community transition grant funds to the Oak Ridge region in order to mitigate the impacts of downsizing on Oak Ridge workers. More information can be found in *The Economic Benefits of the U.S. Department of Energy For The State of Tennessee, Fiscal Year 1998* (DOE, 1999).

While the number of new housing starts (based on building permits issued) in Oak Ridge has declined over the past three years, the sale of existing homes increased from 279 in 1997 to 358 in 1999. The average sale price of a house was $114,424 in 1997, $112,826 in 1998, and $108,853 in 1999 (Oak Ridger Online, 2000).

Environmental Justice. Executive Order 12898 requires Federal agencies to achieve environmental justice "to the greatest extent practicable" by identifying and addressing "disproportionately high and adverse human health or environmental effect of its...activities on minority populations and low-income populations..." The Presidential Memorandum accompanying the Executive Order directs Federal agencies to "analyze the environmental effects...of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the National Environmental Policy Act." The Presidential Memorandum also requires that Federal agencies "shall provide opportunities for community input in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of meetings, crucial documents, and notices."

Approximately 880,000 people live within a 80-km (50-mile) radius of ORR. Minorities compose 6.1 percent of this population. In 1990, minorities composed 24.1 percent of the population nationally and 17 percent of the population in Tennessee. There are no Federally recognized Native American groups within 80 km of ORR. The percentage of persons below the poverty level is 16.2 percent, which is slightly higher than the 1990 national average of 13.1 percent but much lower than the statewide figure of 30 percent, as concluded by the 1990 census.

The *Lease of Parcel ED-1 EA* (DOE, 1996) provides race distribution and household income for census tracts near ETTP and Y-12 Plant. Of the seven census tracts near ETTP and the Y-12 Plant, none have more than 50 percent minority population. Census tract 201 is the only tract near ETTP and Y-12 Plant with a minority population (42.3 percent) greater than the statewide average of 17 percent.

The *Lease of Parcel ED-1 EA* (DOE, 1996) identified low–income communities using the Federal Poverty Guideline of $14,800 for a family of four and the State of Tennessee median household income level of $24,807, which is based on 1990 census data. However, for the census tracts near Parcel ED-1, data were not available on household income by household size. Only a few low-income communities were noted in the area. Tracts 201 and 205 were identified as having the highest percentage of low-income (or minority) households in areas near Parcel ED-1.

The Scarboro community is a primarily minority community located approximately 1 km (0.5 mi) north of the Y-12 Plant. This community has been included in a number of epidemiological health studies conducted by an independent group overseen by the Tennessee Department of Health. Mercury health studies have shown that estimates for mercury intake for Scarboro residents exceeded standards for inhalation of mercury during the years of peak mercury release from ORR in the late 1950s (ChemRisk 1997a). Impacts of uranium releases to the air on the community between 1944 and 1995 were analyzed to determine if cancer risks from uranium releases are elevated for this community. The analyses reported cancer screening indexes that were slightly lower than the investigators

decision guide for carcinogens, but with a great deal of uncertainty (ChemRisk 1998).

The Health Studies Report of PCB releases from the ORR prior to the early 1970s concluded that some fishermen at the Clinch River and Watts Bar Reservoir have eaten enough fish from these sources to affect their health, including excess cancers, but estimates of how many have been affected are not possible at this time (ChemRisk 1997). Further studies were recommended, including studies of fish and turtle consumption, PCB blood levels in people consuming fish, PCB levels in core samples from the Clinch River and Watts Bar Reservoir, PCB levels in the soils near PFPC, and PCB levels in cattle grazing near the creek. There are no populations in the area completely dependent on consumption of these fish from the Clinch River and Watts Bar Reservoir for subsistence.

3.6 Floodplain and Wetland Values

Wetlands are usually highly productive and biologically diverse ecosystems that provide multiple benefits or values, including flood control, shoreline stabilization, improved water quality, and habitat for fish and wildlife. Wetlands provide habitat for many of the species discussed in Section 3.7 below. Along reservoir shorelines, wetlands are transitional ecosystems between terrestrial and aquatic communities. Wetlands generally include swamps, marshes, natural ponds, mud flats, and other similar areas. Three identifying characteristics of a wetland include hydrophytic vegetation, hydric soils, and wetland hydrology. The Glossary provides a definition of these terms.

Floodplains are relatively flat, low-lying lands adjoining streams and rivers. The floodplain strip that is the subject of the Proposed Action in this EA is the total land area from the low-water line inward to the Boeing Property. The 500-year floodplain is often termed the critical action floodplain. The base floodplain is often defined as the 100-year floodplain, an area that has a 1-percent chance of being inundated in a given year. It does not indicate a time period of 100 years between floods. The 500-year floodplain has a 0.2-percent chance of floodwaters equaling or exceeding this level in a given year. Like wetlands, floodplains provide a range of benefits and values including wildlife habitat, stormwater management, recreational opportunities, and aesthetics.

Floodplain and Wetland Areas. The floodplain and wetland areas located in the floodplain strip and adjacent to and associated with the Boeing Property were surveyed in the field in March 2000. The field survey identified the types, extent, and functions of the wetlands. The floodplain/wetlands assessment can be found in Appendix A of this EA, which contains a figure showing the wetlands associated with the floodplain strip.

As part of the wetland delineation, 23 locations within the floodplain were assessed for their vegetation, soil, and hydrology around Johnson Creek, Campbell Bend, and Roberts Branch. Wetlands along Roberts Branch and Johnson Creek are typical riverine or lacustrine wetlands. The wetlands along vegetated sandbars at the mouths of Roberts Branch and Johnson Creek function as floodwater and sediment retention areas. The wetland areas associated with Campbell Bend have some atypical or man-induced characteristics. Wetlands at the tip of Campbell Bend serve as groundwater discharge areas (TtNUS, 2000). The wetland delineation identified 69 acres of wetlands, or wetlands on 38 percent of the total parcel. Appendix A discusses the specific wetland types associated with each area of the floodplain strip. A conifer community (loblolly pine) once occupied the Campbell Bend area. The conifers have now been replaced with floodplain species. Standing "snags" and downed mature conifers crisscross the flat drainage area at the tip of Campbell Bend and provide habitat for cavity-dwelling birds. The cause of the conifer community's demise is assumed to be the result of the Watts Bar Dam construction and the subsequent changes in hydrology. However, infestations of southern pine bark beetles and natural forest succession have also likely played a role in the demise of the conifer community. An occupied beaver lodge was found in the Campbell Bend area. A hacking platform occupied by a pair of ospreys is located at the mouth of Roberts Branch. Pine beetles have damaged large portions of the pine plantations in the site area (TtNUS, 2000).

Surface Water. The two major streams crossing the floodplain strip are Roberts Branch and Johnson Creek. Roberts Branch is located on the eastern side of the site and flows east into the Clinch River near River Mile 13.5. Johnson Creek is located on the southwestern edge of the property and flows west into the Clinch River near River Mile 9. The headwaters of Johnson Creek are on private property and were not surveyed during the March 2000 wetland delineation. The headwaters of Roberts Branch are deeply incised and bounded on both sides by steep slopes (TtNUS, 2000). Based a topographic map of the site (USGS, 1968), no other identifiable streams or creeks are present.

Because of its nearby location (across the waterway from Campbell Bend), surface water quality data for the ETTP facility is representative of water quality in the Clinch River at the site area. Surface water surveillance is currently conducted at five locations at the ETTP. The two stations nearest the floodplain strip are K-716 and K-901-A. Station K-716 is located downstream from most ETTP operations and waters that flow past this station eventually enter the Clinch River near River Mile 12. Station K-901-A is located at the point where drainage discharges directly into the Clinch River near River Mile 11.5 (ORNL, 1999). Detailed information on ETTP's 1998 surface water quality and monitoring program can be found in the Annual Site Environmental Report for 1998 (ORNL, 1999).

Surface water samples from all five stations are analyzed monthly for radionuclides and selected metals, and on a quarterly basis for general water quality parameters and organic compounds. Radionuclide results are compared

with Derived Concentration Guidelines (DCGs) and nonradiological results are compared with Tennessee Water Quality standards (WQSs) for fish and aquatic life. The sum of the radionuclide results for each of the five surface water monitoring stations, including Stations K-716 and K-901-A (Table 2) remained below the annual limit as required by DOE Order 5400.5. Results of the analyses for nonradiological parameters were also well below the applicable standards. Heavy metals were occasionally detected but always in very low concentrations (Table 2). In addition to water quality analyses, waterbodies in the vicinity of the ETTP are regularly inspected for signs of stress on aquatic organisms. No evidence of negative impact on the aquatic communities was discovered during 1998 (ORNL, 1999). Based on the Annual Environmental Report, analytical results for samples collected upstream of the ETTP were chemically similar in most respects to those collected below the ETTP.

Table 2. Summary of 1998 water quality monitoring results for Stations K-716 and K-901-A.

Parameter[a,b]	Maximum	Minimum	Reference Value or DCGc
Alkalinity	150	66	NA
Chromium	0.046	0.0025	0.016
Dissolved Oxygen	11	4.0	5.0 min
Dissolved Solids	180	110	NA
Fluoride	0.19	0.1	NA
Lead	0.0053	0.0005	0.082
Manganese	0.55	0.026	NA
Suspended Solids	46	1.0	NA
Temperature (C)	27	7.0	NA
Uranium	0.0038	0.0006	NA
Zinc	0.027	0.005	0.12
pH (standard units)	7.8	6.7	6.5-8.5
Biochemical Oxygen Demand	9.8	5	NA
U-234	1.2e+00	1.9e-01	5.0e+02
U-235	1.6e-01	9.3e-03	6.0e+02
U-238	1.3e+00	2.0e-01	6.0e+02
Tc-99	4.4e+01	-1.1e+01	1.0e+05
Gross Alpha	4.4E+00	-3.5e-01	NA
Gross Beta	2.5e+01	-4.1e-01	NA

NA = Not applicable
a = from ORNL, 1999
b = pCi/L for radionuclides, mg/L for non-radiological parameters unless otherwise noted
c = Reference values for radionuclides are DCGs; reference values for non-radiological parameters are Tennessee Water Quality Criteria for fish and aquatic life.

Groundwater. The Clinch River, which serves as a regional discharge boundary, influences groundwater flow in the site area. Virtually all of the groundwater in the shallow aquifers under the site discharges to the Clinch River. Discharges occur directly as subsurface flow via discharge zones such as Roberts Branch and Johnson Creek. The only exception is in the area just southeast of Pine Ridge, where there is a component of groundwater flow that is directed away from the property toward Gallaher Road (TSA, 1981). The primary source of water for Roberts Branch and Johnson Creek wetlands is believed to be surface water with some secondary groundwater discharge. Wetlands associated with Campbell Bend appeared to be primarily supplied by groundwater discharges (TtNUS, 2000). In general, the groundwater chemistry in the site area is similar to other areas in Anderson and Roane Counties and reflects the natural geologic environment (TSA, 1981). Table 3 presents a summary of groundwater data in the site area as presented in TSA (1981).

Table 3. Average groundwater quality data in the site area by geological unit.

Parameter[a,b]	USEPA Secondary Drinking Water Standard[a,b]	Formation			
		Rome	Chicamauga	Knox	Overburden
Calcium	NA	28	47	29	40
Magnesium	NA	12	16	16	15
Potassium	NA	2.2	3.3	1.2	2.4
Sodium	NA	5.7	20	2.2	2.7
Iron	0.3	0.28	0.32	0.40	0.65
Manganese	0.05	0.19	0.02	0.025	0.59
Zinc	5.0	0.021	0.026	0.020	5.4
Bicarbonate	NA	170	300	190	160
Sulfate	250	12	15	15	20
Nitrate	10	0.12	0.42	0.50	0.21
Fluoride	1.4-2.4	0.11	0.60	0.33	0.20
pH (standard units)	6.5-8.5	7.6	7.7	7.8	7.8
Specific Conductance	NA	260	400	280	250
Total Dissolved Solids	500	180	300	190	203
Total Organic Carbon	NA	37	33	43	15
Gross alpha	15	--	4.8	6.3	2.3

NA = Not applicable
a = from TSA, 1981
b = pCi/L for radionuclides, mg/L for non-radiological parameters unless otherwise noted

Historic mapping and hydrogeologic studies were conducted in 1981-1982 to establish baseline groundwater quality as well as other geo-technical parameters. A total of 52 monitoring wells were installed in 1981; 5 additional wells were installed in 1988. The wells were plugged and abandoned in 1989. The results of the well monitoring program are summarized in TDEC (2000). Current use restrictions on the property prohibit the use of groundwater. Both TDEC and DOE maintain long-term programs to monitor the quality of drinking water at numerous off-site residential wells including in the vicinity of the Boeing Property. The nearest TDEC monitoring site to the Boeing Property is the Smith residential well (west of the site) near Union Chapel along Lawnville Road. Historical analytical data indicates high levels of iron and aluminum but no detections of radionuclides or VOCs (TDEC, 2000).

DOE conducted additional groundwater sampling in October 2000 to further evaluate the characteristics of groundwater on the floodplain strip (DOE 2000a). DOE collected six groundwater samples at TDEC-approved sampling locations throughout the property. The locations of these samples are provided on Figure 4. Samples were analyzed for the following: VOCs; SVOCs; polychlorinated biphenyls (PCBs); target analyte list (TAL) metals; gross alpha, gross beta, total uranium, and gamma spectrometry (Cs-137 and Co-60). Also, one sample was analyzed for the following radiological constituents: isotopic uranium, isotopic plutonium, americium-241, neptunium-237, strontium-90, technecium-99, and tritium (H-3).

No VOCs, PCBs, or isotopic analytes were detected in any samples. All SVOCs were reported as non-detect, except for bis(2-ethylhexyl)phthalate in one sample. Aluminum, iron, manganese, calcium, magnesium, potassium, and sodium were detected in all samples, but these are common, naturally-occurring chemicals (DOE 2000a). The results of the uranium and isotopic uranium analyses indicated that uranium is present at low concentrations typical of background conditions. All Ce-137 and Co-60 concentrations were below detection limits, with the exception of 117 pCi/L for Cs-137 in one sample; however, it was not detected in its duplicate sample. Gross alpha and gross beta were measured in all samples, but was attributed to the presence of different levels of suspended solids. While some individual sample results were estimated to exceed the 15 pCi/L MCL for gross alpha, the mean was estimated to be below the MCL. All gross beta results were estimated to be less than the MCL of 50 pCi/L, with a mean of 26 pCi/L.

The study concluded that it did not appear that groundwater at the floodplain strip was contaminated (DOE 2000a).

3.7 Ecological Resources

This section provides summary information on aquatic and terrestrial wildlife, with emphasis on threatened and endangered species. The site area is biologically diverse with a range of habitat types (bottomland hardwood, wetlands, pine plantations, and old-field successional areas). In 1995, the Nature Conservancy reported on a preliminary study of the biodiversity of the ORR. Eighty-eight distinct conservation sites and three large landscape complexes were identified as important to biodiversity on the ORR because of the presence of rare species, rare communities, and large blocks of high-quality vegetation (TNC, 1995).

The aquatic habitat in the Clinch River is indicative of a slow-moving river or lake environment with diverse community structure and occasionally high seasonal abundance of phytoplankton and zooplankton. The fishery in the Clinch River (River Miles 12-18) is classified primarily as a cool-warm water community. Over 50 species of fish have been reported in the area. The stretch of river along the floodplain strip is not considered a commercial fisheries area (TSA, 1981). Littoral species of fish likely use the shallow-water areas of the floodplain strip.

The floodplain strip has been identified as a biologically diverse area and an area of "very high biological significance" by The Nature Conservancy. Ecologically, the floodplain strip has a rich diversity of flora and fauna. The upland sections of the site area, which comprise the vast majority of the site area, are a mixture of stands of hardwoods and conifers. These forested areas can be divided into five dominant vegetation types, which include oak-hickory, pine (natural and planted), mixed hardwood-pine, mixed hardwood-cedar, and bottomland hardwood (TSA, 1981). As mentioned previously, 500 acres in the site area were logged in 1996; 150 acres in the Campbell Bend area were subsequently reforested. The mixed hardwood-cedar community resulted from agricultural abandonment (TSA, 1981). The Boeing Property contains the best-known remaining example of rare cedar barrens in Tennessee. The Crowder Cemetery barrens, one of the largest barrens in the site area contains a high diversity of plant species (DOE, 1987). Smaller barrens are scattered across the Boeing Property. Some oldfield cover exists on the site area, but most of these areas are in sapling or pole timber stages, with few areas still dominated by herbaceous vegetation (TSA, 1981). Cleared terrestrial areas include a transmission line right-of-way, gravel roads, scattered cemeteries, two excavated areas near the entrance to the Boeing Property, and an abandoned quarry (DOE, 1987).

The site area, in general, has evidenced 36 species of amphibians and reptiles, 121 species of birds, and 19 species of mammals (DOE, 1987). This diversity of species is likely due to the number of habitat types present on the site area. For birds, the site area provides cover, feeding, roosting, and nesting sites of various types (TSA, 1981), including habitat for piscivorous birds and waterfowl. The variety of habitats and edge areas between dominant vegetation types would also likely foster the diversity of mammals on the site area.

The *Endangered Species Act of 1973,* as amended, (1) establishes procedures for identifying animal and plant species in need of protection, (2) requires all Federal agencies to determine if their activities are likely to jeopardize the

continued existence of listed species, and (3) sets penalties for illegal taking, possession, or sale of listed species.

To satisfy informal consultation requirements of Section 7 of the Endangered Species Act, DOE corresponded with the U.S. Fish and Wildlife Service (USFWS) to determine if conveyance of the floodplain strip from Federal control would jeopardize any Federally threatened or endangered species or critical habitats. Also, DOE contacted the Tennessee Department of Environment and Conservation (TDEC) to determine if any state-listed threatened or endangered species were present in the floodplain area. Appendix C presents the correspondence with USFWS and TDEC.

USFWS stated that the Federally-endangered Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*) may occur in the area (Table 4). USFWS did not indicate in correspondence that any critical habitats were present. TDEC indicated that four state-listed species of animals could occur within a one-mile radius of the floodplain strip. TDEC indicated also that seven state-listed species of plants could be found in the site area (Table 4). In addition, the list of species provided by the state was cross-listed with the lists of nationally published Federally-listed species (http://ecos.fws.gov) to determine if any of the state-listed species could also be Federally listed. None of the state-listed species of plants or animals appeared on the USFWS lists of Federally-listed species.

A biological assessment was conducted to determine if the impacts associated with conveyance of the floodplain strip could adversely affect the Indiana bat or gray bat on the floodplain strip. Indiana bats hibernate in caves, and gray bats roost and hibernate exclusively in caves. No caves exist on the floodplain strip or the adjacent Boeing Property. Thus, Indiana bats would not hibernate in the site area and gray bats would not roost or hibernate in the site area. The floodplain strip was surveyed to determine if suitable habitat for Indiana bats, a tree-roosting species, was present on the floodplain strip. The endangered bat biological assessment report is presented in Appendix D.

The different plant communities on the floodplain strip were rated for the presence and quality of Indiana bat roosting habitat and foraging habitat. Five criteria were used in rating roosting habitat (e.g., presence of snags) and five criteria were used in rating foraging habitat (e.g., high plant species diversity). For each criterion, a community was awarded a single point and, thus, a maximum of five and minimum of zero could be scored for both foraging and roosting habitat. A score of zero indicates no habitat; one or two represents very poor to poor potential for habitat; three indicates fair potential for habitat; four indicates good potential for habitat; and five indicates excellent potential for habitat. Of the total acreage of the communities surveyed, approximately 98 percent of the floodplain strip contained poor to fair habitat. Only an upland oak/hickory forested area approximately 3 acres in size contained excellent potential for roosting and foraging habitat for the Indiana bat. Appendix D contains a figure depicting the quality of potential Indiana bat foraging and roosting habitat on the floodplain strip by plant community.

Table 4. Listed species that occur or could occur in the site area.

Species	State Status	Federal Status
Appalachian bugbane (*Cimicifuga rubifolia*)	Threatened Plant	---
Spreading false foxglove (*Aureolaria patula*)	Threatened Plant	---
Branching Whitlow-Grass (*Draba ramosissima*)	Special Concern Plant	---
Tall larkspur (*Delphinium exaltatum*)	Endangered Plant	---
Goldenseal *(Hydrastis canadensis*)	Special concern Plant	---
Canada Lily (*Lilium canadense)*	Threatened Plant	---
Heller's Catfoot *(Gnaphalium helleri)*	Threatened Plant	---
Woodland Jumping Mouse (*Napaezozapus insignis*)	Mammal Deemed In Need of Management	---
Spiny Pigtoe (*Fusconaia edgariana*)	Endangered Mollusc	---
Pyramid Pigtoe *(Pluerobema rubrum*)	Mollusc Considered Rare by Division of Natural Heritage	---
Indiana bat (*Myotis sodalis*)	Endangered* Mammal	Endangered
Gray bat (Myotis *grisescens)*	Endangered* Mammal	Endangered

* not provided on state list as potentially present on the floodplain strip or present in Roane County

3.8 Cultural and Archaeological Resources

Cultural resources are those aspects of the physical environment that relate to human culture and society, and those cultural institutions that hold communities together and link them to their surroundings. These resources include prehistoric resources, historic resources, and traditional cultural properties and practices. The cultural resources present in the region surrounding the proposed project area are complex due to the long prehistoric occupation of the area, the relocation of the Cherokee from villages during historic times, and the presence of well-established settlements prior to acquisition of the ORR by the Federal government. DOE corresponded with the State Historic Preservation Officer (SHPO) during the conduct of these analyses. A copy of the correspondence letter received from the SHPO is provided in Appendix C.

Historically, the site area once included homesteads associated with the early historic settlement of the Clinch River valley. A total of 15 farms operated here at different periods between approximately 1800 to 1930. Sufficient documentation and physical evidence of only 5 farmsteads remain. The locations of each of the farmsteads and cemeteries are shown in Figure 3. The McKinney Plantation, which was probably established in the early 1800s, is located on the edge of the limestone bluff overlooking the river to the northwest. A few hundred yards north is the family cemetery, including graves of Annanias McKinney (1805-1882) son of the plantation founder, and his wife Elizabeth (1811-1892) (TSA, 1981).

A second cemetery is located on the river bend's southern perimeter and is part of the Cate farm. Known as the Roberts cemetery, it may predate the Cate family occupation from approximately 1890 to the 1930s. The Cate Farm has well-preserved historic archaeological evidence of settlement, as well as fields bounded by stone walls. (TSA, 1981). West of the Cate Farm is the Cook residence, which operated as a farm beginning about 1910.

Two stone enclosures with at least three unmarked burials are located on the Hacker Plantation, which is located south of Campbell Bend. These graves may be associated with a farm settlement dating from the early decades of the 19th century, but are more recently associated with the Hacker family (TSA 1981). Early settlement at the nearby Town of Union and along the adjacent valley followed the principle road running southwest to Lawnville and Kingston. Travel north to Oak Ridge was accomplished by crossing the Clinch River at Gallaher's Ferry, previously located near a now abandoned limestone quarry (TSA, 1981).

Archaeological site inventories were initiated along the Clinch River in the 1930s, as part of the dam building programs in the Tennessee River Valley. The site was first inventoried in 1941. In 1974, ORNL conducted an archaeological survey of the ORR and identified at least three archaeological sites in the floodplain strip (Fielder, 1974). DuVall and Sousa (1996), in a review of the prehistoric archaeology of Anderson and Roane Counties, identified four sites that are located within the area proposed for transfer. These sites are presented in Table 5. It should be noted that the locations of these sites are not presented in this EA as per a request by the State as to discourage vandalism, damage, or unauthorized collection of artifacts from these sites. Two of these sites will be excluded from the land conveyance (Section 5.3).

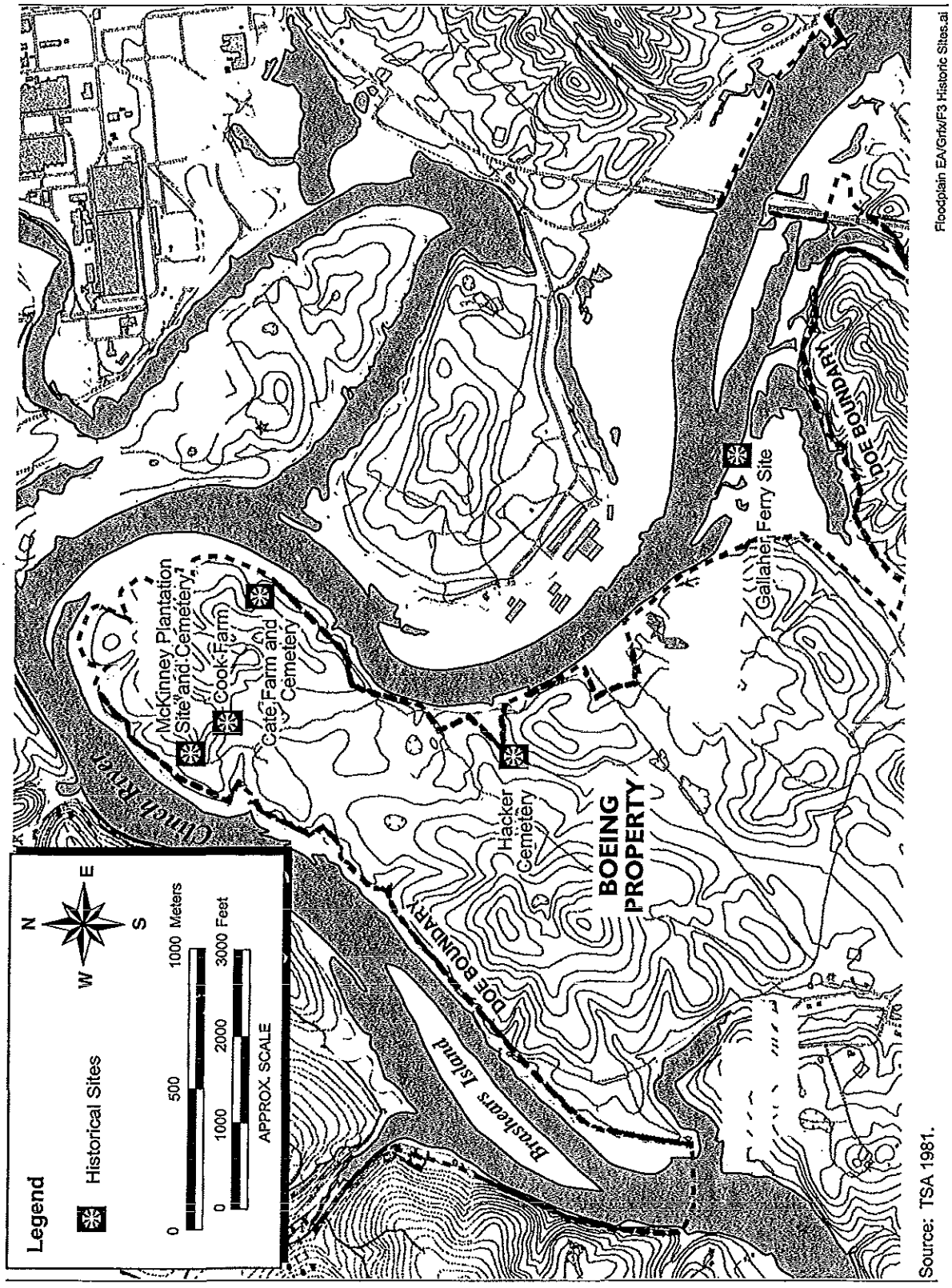

Figure 3. Historic Sites.

Table 5. Archaeological Sites Located Within the Proposed Project Area.

Site Number	Survey	Name / Cultural Affiliation	NRHP Eligibility
40 RE 86	DuVall and Sousa (1996)	Unnamed / Archaic, Woodland, and Missippian	Yes
40 RE 87	DuVall and Sousa (1996); Fielder (1974)	Campbell Farm Site / Archaic	No
40 RE 89	DuVall and Sousa (1996); Fielder (1974)	Roberts Branch Site / Late Mississippian	Yes
40 RE 90	DuVall and Sousa (1996); Fielder (1974)	Roberts Branch Mounds site / Late Woodland	No

Two of the sites listed in the above table have been determined eligible for the National Register of Historic Places (NRHP). Sites 40 RE 86 and 40 RE 87 (tentatively determined to be Archaic by Fielder, 1974) are associated with the Archaic period (ca. 8000 B.C. to 900 B.C.) (DuVall and Sousa, 1996). Archaic people were hunters and gatherers. Early Archaic peoples appear to have preferred a floodplain environment (DuVall and Sousa, 1996). Site 40 RE 86 is associated with the Woodland period (900 B.C. to A.D. 1000). The Woodland period is characterized by changes in both belief systems and material culture as demonstrated by the appearance of pottery, burial mounds, and the first signs of agriculture (DuVall and Sousa, 1996). Sites 40 RE 86 and 40 RE 89 are Mississippian period sites (A.D. 900 to A.D. 1600). The Mississippian cultures are generally regarded as having achieved the highest level of sociocultural and political complexity known to North American prehistoric cultures (DuVall and Sousa, 1996).

Currently, no Native American traditional or religious areas are known to be present within the ORR.

3.9 Public Health

This section describes the radiological and chemical environment in the Oak Ridge area. Members of the public may be exposed to contaminants in air and water. The facility nearest the floodplain strip which has radioactive emissions is the Toxic Substance Control Act (TSCA) Incinerator at ETTP. The Spallation Neutron Source EIS (DOE, 1999a) identifies the other facilities in the Oak Ridge area that contribute to the total exposure to the public around the ORR.

During 1996, the effects of radionuclides released to the atmosphere from ORR operations were evaluated by calculating the Effective Dose Equivalent (EDE) to maximally exposed off-site individuals and to the entire population residing within 50 miles of the center of ORR. The EDE received by the hypothetical maximally exposed individual for the ORR was calculated to be about 0.45 millirem, which is below the National Emissions Standards for Hazardous Air Pollutants (NESHAP) standard of 10 millirem, and well below the 300 millirem that the average individual receives from natural sources of radiation (DOE, 1999a). The maximally exposed individual is located about 0.7 mile north-northeast of the Y-12 Plant release point, about 5.8 miles northeast of the 3039 stack at ORNL, and about 8.1 miles east-northeast of the K-1435 (TSCA Incinerator) stack at ETTP. The calculated collective EDE to the entire population within 50 miles of the ORR was about 9.9 person-rem, which is approximately 0.004 percent of the 264,000 person-rem that this population could have received from natural sources of radiation (DOE, 1999a).

Radionuclides discharged to surface waters from the ORR enter the Tennessee River system by way of the Clinch River and various feeder streams. Discharges from the Y-12 Plant enter the Clinch River by way of Bear Creek and East Fork Poplar Creek, both of which enter Poplar Creek before it enters the Clinch River, and by direct discharge from Rogers Creek and White Oak Creek and White Oak Lake. Discharges from ETTP enter the Clinch River by way of Poplar Creek (DOE, 1999a)

The potential radiological impacts of these discharges to persons who drink water, eat fish, swim, boat, and use the shoreline at various locations along the Clinch and Tennessee Rivers are evaluated annually. When all pathways are considered, the maximum EDE resulting from waterborne discharges is about 1.5 millirem: 1.2 millirem from use of off-site water, plus 0.3 millirem from drinking Kingston water (DOE, 1999a). The collective EDE to the 50-mile population was estimated to be about 2.0 person-rem. These are small percentages of individual and collective doses attributable to natural background radiation, which are 0.5 percent and 0.0008 percent respectively (DOE, 1999a).

The Tennessee Department of Environment and Conservation surveyed the floodplain strip for radiological contamination. Eight locations along the Clinch River showed levels of radioactivity higher than twice the normal background levels of 7,500 counts per minute, although no gamma readings in the study area were cause for immediate concerns. Figure 4 shows locations where sediment samples were collected. Sampling locations were chosen based on a fly-over survey and field monitoring that identified small areas contaminated with cesium. The highest level of radioactivity measured in these cesium-contaminated areas was 4.4 picocuries per gram gram (TDEC, 2000). It is possible that sediments contaminated with cesium-137 moved downstream with releases from White Oak Dam during floods, then settled in backwater, island, tail-water, and sand bar areas along the Clinch River. The identified areas are underwater most of the year (TDEC, 2000).

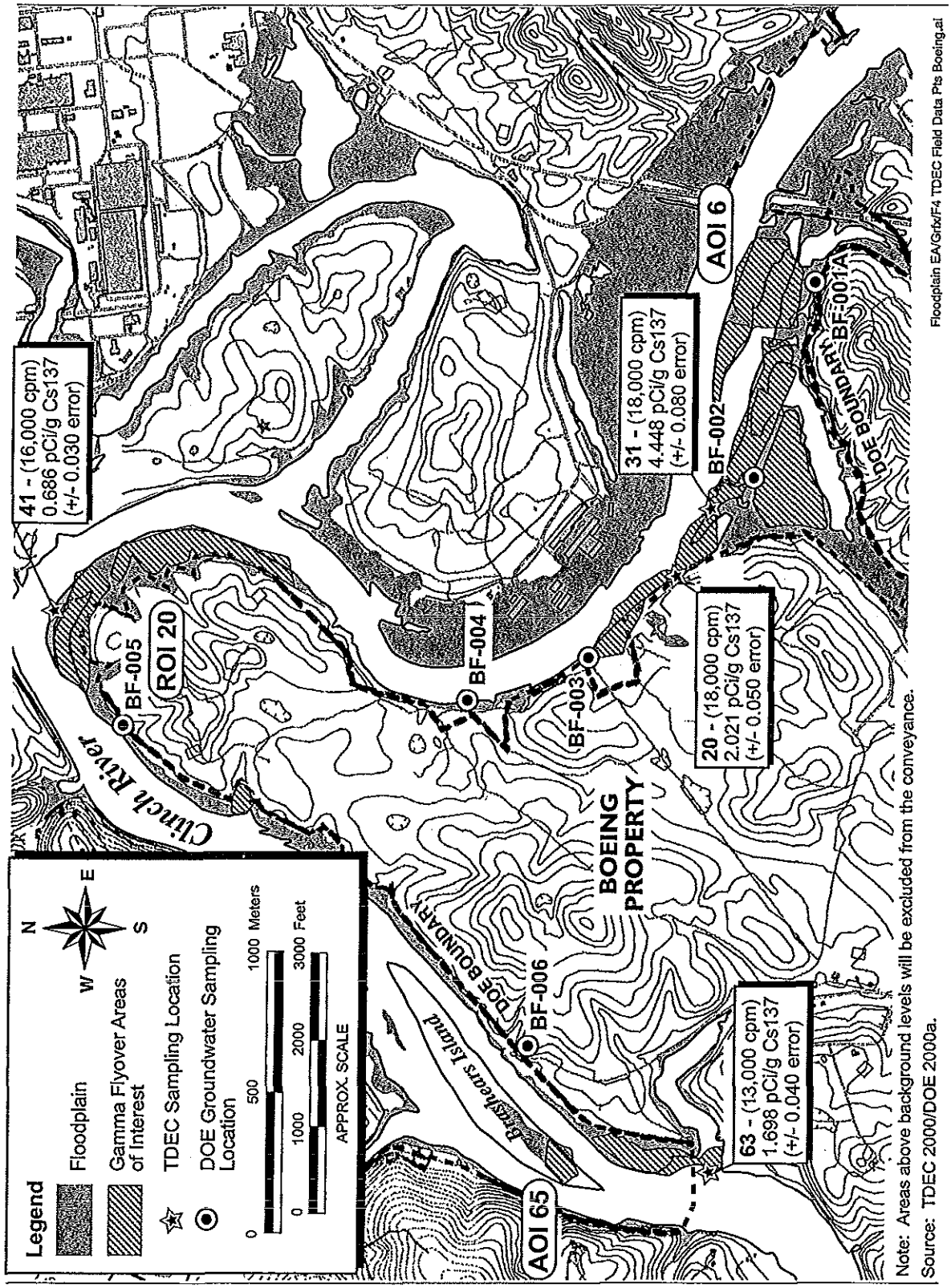

Figure 4. TDEC and DOE Field Data Points - Boeing Property.

Appendix B provides excerpted information from the TDEC radiological report issued by the State. Using conservative exposure assumptions, the State calculated a hypothetical dose of 90 millirem that could be received by an individual residing at the most contaminated location (4.4 pCi/g) for one year (TDEC, 2000). However, exposure to radioactive materials is usually presented in terms of radiation dose equivalent. DOE (2000a) conducted these calculations for the shoreline use scenario presented in the Remedial Investigation/Feasibility Study (RI/FS) of the Clinch River/Poplar Creek Operable Unit (DOE, 1996), and for a recreational use scenario. Furthermore, in order to bracket the potential range of potential impacts, a residential scenario was evaluated using EPA and DOE default parameters, although no residential activities are planned for the floodplain strip under any alternative. External exposure to penetrating radiation was considered to be the major exposure route for both exposure scenarios, although less significant routes of incidental ingestion of sediments and inhalation of suspended particulates were included (DOE, 2000a). The calculations assumed exposure to the maximally-contaminated sediments of 4.4 pCi/g.

Estimates of incremental lifetime cancer risk under all three exposure scenarios were within the EPA target risk range of 10^{-6} to 10^{-4} established under the National Contingency Plan (NCP)(DOE, 2000a). Thus, DOE concluded that release of the floodplain strip for mixed-use development would not be expected to result in any unacceptable risk to human health and that the property was suitable for release as an uncontaminated property under CERCLA Section 120(h)(4) (DOE, 2000a). Excerpted information from DOE's groundwater report is presented in Appendix B. Based on the TDEC's sediment findings, the results of recent DOE groundwater sampling, and the results of DOE's conservative risk calculations, EPA has issued a letter stating concurrence with DOE's classification of the floodplain strip as "uncontaminated" under CERCLA Section 120(h)(4)(B). A copy of EPA's letter is contained in Appendix C.

The major sources of chemical pollutants at ETTP are the three remaining steam-generating units at the K-1501 Steam Plant and the TSCA Incinerator. Signature pollutants of steam plants include sulfur dioxide, nitrogen oxides, carbon monoxide, particulates, and volatile organic compounds. The TSCA Incinerator is monitored for lead, beryllium, mercury, fluorine, chlorine, sulfur dioxide, and particulates (DOE, 1999a).

Water discharge monitoring from ETTP in 1996 indicated one excursion for total petroleum hydrocarbons and three for unpermitted discharges. Aside from those four noncompliance episodes, all discharges into receiving waters were within National Pollutant Discharge Elimination System (NPDES) permit limits (DOE, 1999a). Concurrent to the assessment performed by TDEC on the floodplain strip, which included extensive walkovers of the length of the property, the prospective purchaser of the Boeing Property contracted to have a CERCLA Section 120(h) Assessment conducted. A variety of Federal, state, and county resources were reviewed to determine whether or not available information indicates hazardous substances were stored, disposed of, or released onto DOE property adjacent to the Boeing Property. Information sources used in this search included interviews, reports, maps, deeds, aerial photographs, and remote sensing data from the 1940s through the 1990s (HIPS, 2000).

Records were also reviewed to determine whether or not adjacent or nearby properties may have contributed to environmental contamination. The adjacent or near-by properties include the Boeing Property, Clinch River/Poplar Creek Operable Unit, and East Tennessee Technology Park.

None of the investigative efforts indicated that hazardous substances have been stored, released or disposed of on the DOE floodplain strip (HIPS, 2000). Appendix B provides excerpted information from the Section 120(h) assessment.

In addition, the *Record of Decision for the Clinch River/Poplar Creek Operable Unit* (DOE, 1997) describes the human health risks associated with contaminated sediments and biota in Watts Bar Reservoir. The Record of Decision (ROD), which was approved by EPA and the State of Tennessee, was based on sampling and analysis conducted as part of a CERCLA Remedial Investigation/Feasibility Study (RI/FS) for the Operable Unit (OU). Although some human health risks were concluded to be present for some radiological and non-radiological compounds in sediments and fish, DOE concluded that, "DOE-related contaminants are found in proportion to water depth, with little contamination in near-shore sediments." Although the ROD did not include surface water, DOE concluded that surface water in the OU meets drinking water standards. Risks from recreational shoreline use were considered acceptable, as were risks associated with swimming (DOE, 1997). The alternative selected by DOE consists of the following:

- Existing institutional controls to control potential sediment-disturbing activities
- Fish consumption advisories to reduce exposure to contaminants in fish tissue
- Annual monitoring to detect changes in contaminant levels or contaminant mobility within the OU
- Survey to confirm effectiveness of fish consumption advisories.

The public accepted this remedy (DOE, 1997).

4.0 Environmental Consequences of the Proposed Action and Alternatives

This section addresses the potential environmental impacts of the Proposed Action and alternatives on the floodplain strip adjoining the Boeing Property. In addition, the indirect impacts associated with potential on the Boeing Property are discussed. Cumulative impacts are summarized in Section 4.9. Alternative 1, Conveyance to the Abutting Landowner for Unrestricted Use, represents the Proposed Action.

Sections 4.1 through 4.8 provide impact analysis on those resource areas that could be affected though the potential impacts are expected to be small.

4.1 Air Quality

Local air quality impacts can arise from land clearing and emissions from construction and personal vehicles on the Boeing Property. Land clearing emissions would be in the form of fugitive dust particles from soil disturbance; vehicle emissions include carbon monoxide, sulfur dioxide, inhalable particulate matter, and unburned hydrocarbons.

Alternative 1 – Conveyance to the Abutting Landowner for Unrestricted Use. No emissions from the floodplain strip are expected except from equipment that could be used for the installation of hiking trails and limited vegetation removal to open up views, in addition to equipment used to install boat docking facilities or a marina. Vehicle emissions associated with the long-term use of the site area would continue. Similarly, some emissions may be associated with boat use along the Clinch River. Dispersion would decrease concentrations of pollutants in the ambient air as distance from the site area increases. Emissions from preparation of the Boeing site for construction would be short term, sporadic and localized and be minor.

Alternative 2 – Conveyance of the Property to TVA. Potential impacts would be less than those described for Alternative 1, as the property would likely remain undeveloped. Also, potential impacts to air quality would likely be similar to Alternative 1 if TVA granted use of the property to the abutting landowner.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. Potential impacts would be similar to those described for Alternative 1, especially if installation of boat docking or a marina were to occur.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to Owner of the Boeing Property. Potential impacts would be similar to those described for Alternative 1, especially if installation of boat docking facilities was allowed.

Alternative 5 – No Action. The absence of improvements would result in little or no direct impacts on air quality under this alternative. Potential indirect impacts would be similar to those described for Alternative 1, associated with development of the Boeing Property.

4.2 Geology and Soils

Development activities and the removal of vegetation increase the potential for soil erosion. When land is cleared for construction, sediment becomes available for transport because of the lack of vegetative cover. Undeveloped forested areas, on the other hand, have less potential to erode because the tree canopy reduces the force of raindrops, soil particles bind with root systems, and the absorption capacity of soils is improved by the organic matter lying over the soil.

Alternative 1 – Conveyance to the Abutting Landowner for Unrestricted Use. Under this alternative, some erosion may occur in the floodplain strip due to the installation of improvements such as hiking trails and limited vegetation removal to open up views. During construction on the Boeing Property, soil erosion control practices would be implemented and wetland areas would be avoided. Within the city limits of Oak Ridge, the Erosion Control and Stormwater Management Ordinance applies. Measures implemented to reduce the degradation of surface water quality must meet the criteria in Article IX, Section 9-420 of the ordinance, which requires: (1) specific practices for minimizing soil loss from the site, including construction of detention basins and other sediment control structures; (2) protection of adjacent and downstream properties; (3) stabilization of disturbed areas and soil stockpiles; (4) treatment of cut and fill slopes; (5) protection of storm sewer inlets, and (6) guidelines for working in wet areas and treating construction access routes. This alternative could involve the construction of boat docks and water access points, and possibly a marina. The potential impacts to soils on the floodplain strip would be minimal due to the short-term duration of the installation period and the small area of land disturbed. Indirect impacts from construction activities on the floodplain strip and Boeing Property would be minor.

Alternative 2 – Conveyance of the Property to TVA. Under this alternative, the potential for soil erosion would be less than under Alternative 1 because no improvements would be made in the floodplain strip unless TVA granted use to the abutting landowner. Potential indirect impacts could occur, however, from land clearing and construction activities on the Boeing Property, regardless of potential, future TVA

ownership of the floodplain strip. Thus, indirect impacts would be similar to those for Alternative 1.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. Under this alternative, impacts to soils would likely be similar to those described in Alternative 1, which include some potential erosion in the floodplain strip due to the installation of improvements such as hiking trails and limited vegetation removal to open up views, or possible boat docking facilities. Indirect impacts from development on the Boeing Property would also be similar to those described in Alternative 1.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to the Owner of the Boeing Property. Under this alternative, DOE could issue easements for necessary utilities and infrastructure over the floodplain property. This would likely result in the same impacts to soils described for Alternative 1. However, the installation and use of potential long-term improvements such as boat docks could be restricted, which would result in diminished impacts to soils. Any granted easements would first be subject to appropriate environmental review. Indirect impacts from development on the Boeing Property would also be similar to those described in Alternative 1.

Alternative 5 – No Action. Under this alternative, the potential for soil erosion would be less than under Alternative 1. No improvements would be made in the floodplain strip. Potential indirect impacts could occur, however, from land clearing construction activities on the Boeing Property, regardless of the ownership of the floodplain strip.

4.3 Land Use and Aesthetics

As described in Section 3.0, the floodplain strip adjacent to the Boeing Property is undeveloped, forested land. The property is currently part of the ORR NERP and may also support intermittent, informal recreational uses such as hunting, camping, and fishing.

Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use. Under this alternative, recreational use of the floodplain strip could increase because of the close proximity of residences on the Boeing Property. Hiking trails and adjoining residential property would facilitate access to the property. Informal recreational opportunities by non-residents of the Boeing Property, to the extent they exist, would likely decline.

From an aesthetics point-of-view, the floodplain strip would remain largely undeveloped, with the exception of some walking trails and limited vegetation removal to open up views in various locations within the floodplain strip and along the Clinch River. Impacts on aesthetics due to potential development on the Boeing Property would be contingent on the

placement of houses and other structures, roads, and similar development. It is possible that some of these structures could be seen from the reservoir, but could be installed in an aesthetically pleasing manner, such as limited felling of trees in the areas to be developed.

If boat docking facilities were constructed, the floodplain strip would transition from an undeveloped, natural shoreline to a condition whereby a limited number of boat docks, and possibly a marina and small support buildings may be visible from various locations within the floodplain and from the Clinch River. Based on a survey conducted by TVA in 1998, shoreline development could be aesthetically positive when boat docks are not placed too close together and are unobtrusive, some shoreline vegetation is retained, and development makes use of a buffer zone (TVA, 1998). However, some indirect impacts from potential development of the Boeing Property could occur.

Alternative 2 – Conveyance of the Property to TVA. Under this alternative, the potential for impacts on aesthetics would be less than under Alternative 1. No improvements would be made in the floodplain strip and, thus, no changes in land use would occur. Potential indirect impacts could occur, however, from land clearing and construction activities on the Boeing Property, regardless of the ownership of the floodplain strip. Indirect impacts on aesthetics due to development on the Boeing Property would likely be similar to Alternative 1 if TVA granted use of the floodplain strip to the abutting landowner.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. Under this alternative, impacts to aesthetics would likely be similar to those described in Alternative 1, which include the floodplain strip remaining undeveloped, with the exception of some walking trails and limited vegetation removal to open up views in various locations within the floodplain strip and along the Clinch River. It is possible that boat docking facilities could be constructed. Indirect impacts on aesthetics due to the development on the Boeing Property could occur.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to Owner of the Boeing Property. Under this alternative, DOE could issue and manage easements for necessary utilities and infrastructure over the floodplain property. This would likely result in the same impacts to aesthetics described for Alternative 1. However, the installation and use of potential long-term improvements such as boat docks could be restricted, which would result in diminished impacts to aesthetics. Any granted easements would first be subject to appropriate environmental review. Impacts on aesthetics would be similar to those described in Alternative 1.

Alternative 5 – No Action. Under this alternative, impacts on aesthetics would be associated with the development on the Boeing Property.

Buildings within the Boeing Property would still be visible from various places within the floodplain strip and from the Clinch River, regardless of the ownership of the floodplain strip. Again, it is likely that these impacts would be minimal.

4.4 Socioeconomics/Environmental Justice

Socioeconomics. The socioeconomic impacts from residential and industrial shoreline development can affect population, income and employment, property values and taxes. Smaller impacts would be expected from recreational development (TVA, 1998).

Because the conveyance of the floodplain strip would not directly change the socioeconomic character of the region, DOE has not conducted a comprehensive socioeconomic analysis of the Proposed Action or the potential development of the Boeing Site. DOE, however, did perform a socioeconomic analysis of Parcel ED-1 (DOE, 1996). DOE believes that because Parcel ED-1 is about the same size as the Boeing Property and both properties would have industrial elements, the Parcel ED-1 analysis can provide some insight on the potential indirect impacts associated with the development of the Boeing Property. It is also possible that prospective employees of companies located on Parcel ED-1 or ETTP could reside on the Boeing Property once it is developed.

Socioeconomic impacts are generally addressed in terms of direct and indirect effects. Direct socioeconomic effects would be those associated with conveyance of the floodplain strip and any activities proposed on the floodplain strip proper. These impacts are expected to miniscule. However, the development of the Boeing Property as proposed could indirectly impact the local economy. The estimated investment for the development is $200 million. Assuming up to 1,500 residential units and an average household size of 2.67 (TVA, 1998), the development could serve as home to about 4,000 residents either migrating to the area or relocating from other parts of Anderson and Roane Counties. This resident population would represent about 3 percent of the total population of Anderson and Roane Counties (about 120,300) in 1996. Population projections performed for the SNS EIS shows a 2005 population for the two counties of about 128,300 people (DOE, 1999a). The Boeing Property residents would still comprise about 3 percent of the total population. The SNS EIS also provides information on the social services, infrastructure and fiscal characteristics of the region. If a large percentage of future Boeing Property residents were to in-migrate from outside Roane and Anderson County, there could be some increased pressure on local services.

The Boeing Property is located in an area of Oak Ridge slated for future growth. The Boeing Property together with ETTP, DOE's Lease Parcel ED-1, and the Clinch River Breeder Reactor Site have been identified as high development potential areas. Collectively, these areas would require infrastructure enhancements. In January 2000, the Oak Ridge City Council approved a resolution that committed $5 million for providing infrastructure improvements to

the "west-end" of Oak Ridge (Oak Ridger Online, 2000). Total infrastructure costs are expected to be about $15 million. The development potential of these properties is further enhanced by plans by the Tennessee Department of Transportation to improve Tennessee State Route 58 and access to Interstate 40.

Environmental Justice. Pursuant to Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations*, environmental justice analyses identify and address disproportionately high and adverse human health or environmental effects on minority or low-income populations from the alternatives included in this EA. Adverse health effects may include bodily impairment, infirmity, illness, or death. Adverse environmental effects include socioeconomic effects, when those impacts are interrelated to impacts on the natural or physical environment.

Environmental justice guidance provided by the CEQ defines "minority" as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic (CEQ 1997). DOE (2000) identifies minority populations as those areas where (a) the minority potentially affected area exceeds 50 percent or (b) the minority population percentage of the potentially affected area is meaningfully greater than the general population or other appropriate unit of geographic analysis. Low-income populations are identified using statistical poverty thresholds from the Bureau of Census (defined in 1990 as 1989 income less than $12,674 for a family of four). Minority population and income data at the census track level are only available from the dicennial census. The most recent data available is from 1990.

Environmental justice impacts occur if the proposed activities result in disproportionately high and adverse human health and environmental effects to minority or low-income populations. Disproportionately high and adverse human health effects are identified by assessing three factors:

- Whether the adverse health effects, which may be measured in risks or rates, are significant or above generally accepted norms. Adverse health effects may include bodily impairment, infirmity, illness, or death.

- Whether health effects occur in a minority population or low-income population affected by cumulative or multiple adverse exposures from environmental hazards.

- Whether the risk or rate of exposure to a minority or low-income population to an environmental hazard is significant and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group.

The potential impacts on socioeconomics and environmental justice are outlined below.

Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use – Improvements to the floodplain strip would be limited to the installation of some boat docks and possibly a marina, with some

hiking trails and other recreational improvements as well. Consequently, the conveyance of the property to the adjacent landowner would not directly influence the in-migration of new residents or influence the tax base. However, there would be some positive benefit accrued by transfer of the property to the adjacent landowner because the transfer would add value to the adjoining property. If boat docking facilities or a marina was constructed, they would likely further enhance the value of the abutting property. TVA reviewed the issue of property values in its Shoreline Initiatives EIS (TVA, 1998). TVA reported that proximity to open space, greenways, parks, and recreational trails tends to add value. Property values are also affected by the quality of the views (TVA, 1998). Some beneficial indirect effects on the local economy could occur associated with construction and subsequent activities on the Boeing Property.

As discussed in Section 3.5, minority and low-income populations comprise a relatively small proportion of the total population in both a 80 km radius of the Y-12 site (and floodplain strip) and in the socioeconomic region of influence. For environmental justice impacts to occur, there must be disproportionately high and adverse human health or environmental impacts on minority or low-income populations. As discussed in Sections 3.9 and 4.8 (Public Health), no significant health risks are expected to the public as a result of the floodplain strip conveyance and, therefore, no disproportionately high and adverse effects on minority or low-income populations would be expected. In addition, no special circumstances exist that would result in disproportionately high and adverse impacts on minority or low-income populations from any exposure pathway. This includes the absence of disturbance of legacy-contaminated area and subsequent impacts to downgradient minority or low-income populations. No indirect impacts on minority or low-income populations are expected associated with development of the Boeing Property.

Alternative 2 – Conveyance of the Property to TVA. Under this alternative, the development of the Boeing Property could proceed. Abutting property values may not appreciate in value as under Alternative 1 because the floodplain strip would remain off-limits to adjacent property owners unless the owner of the Boeing Property was able negotiate use of the floodplain strip with TVA. Because the conveyance of the floodplain strip to TVA and indirect impacts associated with the Boeing Property will have minimal overall human health or environmental effects, no disproportionate effects on minority or low-income populations are expected.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. Under this alternative, impacts are likely to be similar to those described for Alternative 1, especially if boat docking facilities would be constructed. Thus, any potential economic value associated with these facilities would not be realized. Because the conveyance of the floodplain strip to the City of Oak Ridge or Roane County and indirect impacts associated with the Boeing Property will have minimal overall

human health or environmental effects, no disproportionate effects on minority or low-income populations are expected.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to the Owner of the Boeing Property. Under this alternative, DOE could issue easements for necessary utilities and infrastructure over the floodplain property. Thus, impacts described under Alternative 1 are likely. However, the installation and use of potential long-term improvements such as boat docks could be restricted, which would result in diminished economic value of the adjoining property. Any granted easements would first be subject to appropriate environmental review. Development of the Boeing Property could still proceed. Because the conveyance of a lesser estate than fee title for the floodplain strip to the new, potential owner and indirect impacts associated with the Boeing Property will have minimal overall human health or environmental effects, no disproportionate effects on minority or low-income populations are expected.

Alternative 5 – No Action. Abutting property values may not appreciate in value as under Alternative 1 because the floodplain strip would remain under Federal control. Under this alternative, the development of the Boeing Property could proceed which could provide some beneficial indirect effects on the local economy. Direct impacts would be unlikely due to non-conveyance of the property, and because impacts associated with the Boeing Property will have minimal overall human health or environmental effects, no disproportionate effects on minority or low-income populations are expected.

4.5 Floodplain and Wetland Values

DOE has applied the criteria in Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) in the review of this Proposed Action. Executive Order 11988 directs Federal agencies to use their authority to avoid (to the extent possible): the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains, and direct and/or indirect support of floodplain development whenever there is a practicable alternative. Executive Order 11990 directs Federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Pursuant to 10 CFR Part 1022, DOE prepared a Floodplain/Wetlands Assessment which can be found in Appendix A of this EA. An associated statement of findings was published in the Federal Register (Vol. 65, Number 223, pages 75,680 and 75,681).

Because the floodplain strip may be maintained as an undeveloped buffer with no major construction of facilities (other than those noted in Section 2.2), DOE believes the potential impacts to the floodplain and associated wetlands would be minimal. Additionally, TVA possesses a reserved flowage easement and would review proposed actions in the floodplain strip. TVA has established shoreline

management standards implemented through Section 26(a) of the TVA Act for both flowage easement and TVA-owned residential access shoreline. The Section 26(a) permitting process applies to anyone planning to construct, operate or maintain a structure in the Tennessee River or any of its tributaries that affects navigation, flood control, or public lands or reservations. Standards have been established for vegetation management, docks, and other land-based structures. TVA requires owners of flowage easement areas to abide by these standards (TVA, 1998). The review of 26(a) applications ensures compliance with requirements of the TVA Act and other Federal legislation and executive orders, including Executive Orders 11990 and 11988. The focus of the application reviews is to identify potential impacts to navigation, flood control, public lands and reservations, power generation, wetlands, threatened and endangered species, and cultural resources (TVA, 1998).

Because shoreline development can potentially affect water quality, TVA's Shoreline Management Initiative EIS provides a comprehensive discussion of the effects of residential development upon surface water quality. In general, shoreline development and construction on reservoir properties generate both sediment and nutrients which, without proper land use practices, are ultimately carried into the reservoirs (TVA, 1998).

Direct and indirect effects on water quality from shoreline and associated development can occur during initial land disturbance, construction of individual residences, and lawn development. In the case of lawn development, runoff containing fertilizer, herbicides, and pesticides can continue indefinitely.

Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use. Potential impacts to the floodplain and wetlands are expected to be minimal. As discussed in Section 4.1, DOE does not expect heavy erosion within the floodplain area due to the limited scale of the planned activities. Consequently, there would be only minimal opportunities for increased runoff to the Clinch River from activities within the floodplain strip. The potential creation of infrastructure (e.g, roadways) as well as lawns, landscaped areas, and gardens on the Boeing Property, however, could result in some increased runoff, but would still likely result in minor indirect impacts.

TVA provides an assessment of the effects of nutrient enrichment on water bodies in the Tennessee Valley (TVA, 1998). Embayment or backwater portions of reservoirs are more sensitive to nutrient additions than are mainstream portions of reservoirs because there is less flow and water circulation (TVA 1998). The magnitude of the potential impact to water quality is also influenced by the density of lot development, the integrity of the riparian shoreline, and whether or not the development uses individual septic tanks or sewage systems.

However, the installation of boat docks, a marina, and small support buildings could result in additional, though likely minimal, impacts to floodplains and wetlands. Also, the land conveyance would be from the low-water line inward. Boat docks and similar, over-water facilities would

likely be floating structures attached at the low-water line inward. Thus, impacts on floodplains and wetlands would be lessened. Any small support buildings would likely be built on non-floodplain and non-wetland land. Any boat dock or marina installation would be subject to the TVA Section 26(a) permitting process and would ensure compliance with applicable guidelines. If impacts to wetlands could potentially occur in the future, the related activities would also be subject to U.S. Army Corps of Engineers wetlands regulations (33 CFR, Sections 320 through 330, as amended). Also, activities would be subject to the Watts Bar Task Force Review Process.

Alternative 2 – Conveyance of the Property to TVA. No impacts to floodplains, wetlands and associated water quality would be expected from this alternative. Potential runoff from the Boeing Property and indirect impacts, if use of the property was granted to the abutting landowner, would be similar to that described for Alternative 1.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. No impacts to floodplains, wetlands and associated water quality would be expected from this alternative. Potential runoff from the Boeing Property and indirect impacts, however, would be less than that described for Alternative 1.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to the Owner of the Boeing Property. Potential impacts would be similar to those described for Alternative 1, especially if installation of boat docking facilities was not restricted.

Alternative 5 – No Action. No impacts to floodplains, wetlands, and associated water quality would be expected from this alternative. Potential runoff from the Boeing Property, however, would be same as described for Alternative 1.

4.6 Ecological Resources

Shoreline development can modify the physical characteristics of adjacent aquatic habitats, which can result in changes in benthic macroinvertebrate and fish communities. Removal of shoreline vegetation can also impact the habitat of semi-aquatic and terrestrial species.

One effect of shoreline development is the removal of riparian zone vegetation. Removal of vegetation can result in loss of fish cover and shade, which in turn may elevate surface water temperatures. Sediment from construction sites can smother benthic organisms and fish eggs and generally degrade fish spawning and foraging habitat.

TVA assessed the potential impacts to aquatic habitats from shoreline development in its Shoreline Initiatives EIS (TVA, 1998). Activities assessed

included the placement of retaining walls, riprap, dredging, construction of docks and piers, and clearing of stumps, brush, logs, and boulders from a lake's drawdown zone. While some of these activities can have a negative impact on aquatic species, others such as the construction of docks can have long-term positive benefits. For example, while dock and pier construction can have short-term negative impacts by temporarily disturbing a localized area of the lakebed, in the long-term, they can contribute to an increase in fish habitat. Floating piers provide shade, but only limited cover for fishes (TVA 1998).

Terrestrial wildlife may also be affected by shoreline development. TVA provides a discussion of potential impacts of shoreline development on wildlife, particularly birds, in its Shoreline Initiatives EIS (TVA 1998). Potential impacts can be caused by: (1) changes in the species composition and structure of shoreline vegetation, (2) increases in forest fragmentation and edge effects, (3) increased human activity along shorelines, (4) effects on lands managed for natural resource conservation, and (5) increased populations of predatory mammals (including domestic dogs and cats).

As discussed in Section 3.0, DOE corresponded with the USFWS and TDEC regarding the presence of sensitive species on the floodplain strip. Both DOE and the private sector are required to comply with the Endangered Species Act of 1973, as amended. USFWS expressed concern over the possible presence of the Indiana bat and gray bat on the floodplain strip. Because gray bats use caves for both roosting and hibernating, and no caves are present on the floodplain strip, it is highly unlikely that gray bats would be found on the floodplain strip. Gray bats do, however, forage over open water. The results of the biological assessment presented in Appendix D suggest that, in general, the floodplain strip provides marginal roosting and foraging habitat for this species.

The potential impacts on ecological resources are described below.

Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use. Because the fundamental character of the floodplain is not expected to change from its current use, DOE does not expect discernible direct impacts to the ecological resources of the floodplain strip. Some wildlife dislocations could be expected due to potential development of the Boeing Property and the increased presence of humans and domestic animals. The overall biological diversity and productivity of the site area would be reduced locally due to the conversion of land from natural area to a mixed-use development on the Boeing Property. Thus, the majority of impacts, including any impacts on biodiversity, would be indirect and associated with the Boeing Property.

Boat docks, a marina, and small support structures may also be constructed. While the construction of these items would result in some disturbances for wildlife, they are still expected to be short-term and minor. Any impacts would be minor and limited to initial construction activities. The footprint of these structures would constitute a minuscule portion of the floodplain strip, including the in-shore areas that are utilized by aquatic and semi-aquatic wildlife. Long-term benefits to fish population

could result from the installation of boat docks, which can provide habitat. The installation of boat docks, a marina, and small support structures is not believed to result in impacts to surface water quality and no associated impacts on aquatic organisms would be expected. Impacts to gray or Indiana bats would be negligible. Impacts on State-listed plant (or animal) species would be possible from clearing of vegetation on the floodplain strip, but would be unlikely given the relatively small portion of the floodplain strip for which improvements are planned.

Alternative 2 – Conveyance of the Property to TVA. The potential impacts under this alternative would be limited to those associated with development of the Boeing Property, which would result in altered habitat and the increased presence of humans and domestic animals. Impacts to gray or Indiana bats or State-listed species would be negligible. Impacts would be similar to those described in Alternative 1 if TVA granted use of the floodplain strip to the abutting landowner.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. The potential impacts under this alternative would be similar to but slightly less than those described under Alternative 1, especially if boat docking facilities are constructed. Impacts to gray or Indiana bats or State-listed species would be negligible.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to the Owner of the Boeing Property. Potential impacts would be similar to those described for Alternative 1, especially if installation of boat docking facilities was not restricted. Impacts to gray or Indiana bats or State-listed species would be negligible.

Alternative 5 – No Action. The potential impacts under this alternative would be limited to those associated with development of the Boeing Property, which would result in altered habitat and the increased presence of humans and domestic animals. No impacts to gray or Indiana bats or State-listed species would be expected.

4.7 Cultural and Archaeological Resources

Potential impacts to cultural and archaeological resources can include destruction, alteration, isolation, and loss of protection, or the introduction of visible, audible, or atmospheric elements out of character with the resource.

Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use. First, under the Criteria of Adverse Effect (36 CFR 800.5[a][1]), the transfer, lease or sale of National Register of Historic Places (NRHP) that result in eligible or potentially eligible cultural resources being removed from Federal control is an adverse effect. Eligible cultural resources are present in the floodplain strip and thus could be impacted if they were to be included within the transfer and

removed from Federal ownership, thereby removing them from future consideration under the National Historic Preservation Act and Archeological Resources Protection Act. However, the recognized eligible sites have been excluded from the conveyance action.

Indirect impacts would be anticipated from the land use contemplated for the Boeing Property. Preserving the floodplain strip as a natural area or green space would have the beneficial effect of minimizing more destructive and intrusive types of land development, thus allowing passive preservation of cultural resources in the area. However, recreational uses and any development of trails or roads into the floodplain strip would increase access by the public to cultural resources. The installation of boat docking facilities or a marina would further increase access by the public. Increased access could cause possible destruction and damage to resources, vandalism, and unauthorized collection of materials and artifacts. Also, construction of trails and access points could physically impact the integrity of cultural resources, both known resources and those that are subsurface.

Alternative 2 – Conveyance of the Property to TVA - Indirect impacts would be anticipated from the land use contemplated for the Boeing Property. If TVA granted use of the floodplain strip to the abutting owner, impacts would be similar to those described in Alternative 1, including indirect impacts.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. Under this alternative, the impacts would be similar to those described for Alternative 1, depending on whether boat docking facilities or a marina would be constructed.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to the Owner of the Boeing Property. Potential impacts would be similar to those described for Alternative 1, especially if installation of boat docking facilities was not restricted.

Alternative 5 - No Action. The No Action Alternative would result in continuing Federal ownership of the floodplain strip. Other positive impacts of the No Action Alternative would be the passive preservation of resources, due to lack of improvements in the floodplain strip. Ongoing negative impacts from natural processes, such as erosion, on the physical integrity of cultural resources would continue. Also, the potential for negative impacts due to inadequate surveillance would continue. These impacts could include unintentional destruction or damage of resources, vandalism, and unauthorized collection of materials and artifacts.

4.8 Public Health

Public health impacts can arise by contamination moving through the air and water pathways to human receptors. As indicated in Section 3.5, low levels of legacy contamination have been located in or near the floodplain strip. As a result of the visual and radiological characterization of the floodplain strip conducted by TDEC and risk calculations performed by DOE, and the fact the potentially affected areas would only have intermittent use by people, DOE has concluded the risk to public health is low (see analyses below) under any alternative.

Alternative 1 – Conveyance of the Property to the Abutting Landowner for Unrestricted Use. Using conservative exposure assumptions, the State calculated a hypothetical dose of 90 millirem that could be received by an individual residing at the most contaminated location (4.4 pCi/g) for one year (TDEC, 2000). Since this location (Field Site 31) is not planned for residential habitation and may be under water part of the year, the hypothetical dose establishes the upper bound for any possible exposures. Given the intermittent recreational use of any areas in close proximity to a potentially contaminated site, the resultant dose could be much less than for a full-time resident at the same location. For instance, if an individual were to spend 500 hours per year at the most contaminated location, the external dose extrapolated from the State's estimates would be approximately 5 millirem per year.

The DOE and State limit for exposure to an individual member of the public from all sources, except background, is 100 millirem per year. The CERCLA decision on Watts Bar addressed sediments and the Watts Bar Interagency Working Group has established 15 piCi/g as their action limit (Jacobs, 1995).

If boat docking facilities were constructed, the likelihood of residents coming into contact with floodplain surface water and sediment would increase, mainly as part of boating or swimming activities. Also, boat docking facility construction would increase contact with surface water and sediment for construction workers. Moreover, docks would likely be floating docks and, hence, disturbance of the sediments would be held to a minimum during construction.

The Interagency Agreement for Watts Bar Reservoir states that non-commercial fixed and floating boat slips, non-commercial fixed and floating boat docks with supports driven above elevation 731, land conveyances above normal pool, walkways, and removal of undesirable growth were associated with "no significant sediment disturbance." The ROD associated with Watts Bar Reservoir indicated that risks associated with recreational shoreline use, including swimming, were acceptable (DOE, 1997). DOE-related contaminants in sediments were generally below the sediment surface and confined to the main stream channel. Existing institutional controls, if followed, would limit exposure to contaminants in fish.

The CERCLA decision on Watts Bar addressed sediments and the Watts Bar Interagency Working Group has established 15 piCi/g as their action limit (Jacobs, 1995). The highest detected concentration of the contaminated areas on the floodplain strip (cesium contamination) was 4.4 piCi/g (TDEC, 2000). DOE calculated human health risks for residential, shoreline, and recreational use of the floodplain strip based on exposure to the 4.4 pCi/g concentration. Estimates of incremental lifetime cancer risk under all three exposure scenarios were within the EPA target risk range of 10^{-6} to 10^{-4} established under the National Contingency Plan (NCP). Thus, DOE concluded that release of the floodplain strip for mixed use development would not be expected to result in any unacceptable risk to human health and that the property was suitable for release as an uncontaminated property under CERCLA Section 120(h)(4) (DOE, 2000a). Based on the TDEC's sediment findings, the results of recent DOE groundwater sampling, and the results of DOE's conservative risk calculations, EPA has issued a letter stating concurrence with DOE's classification of the floodplain strip as "uncontaminated" under CERCLA Section 120(h)(4)(B). A copy of EPA's letter is contained in Appendix C.

For these reasons, it is unlikely that impacts to public health would occur under this alternative.

Alternative 2 – Conveyance of the Property to TVA. There would be a smaller chance of exposure under this alternative because human activity within the floodplain strip would be less than under Alternative 1 unless TVA granted use to the abutting landowner.

Alternative 3 – Conveyance of the Property to the City of Oak Ridge or Roane County. Under this alternative, the impacts would be similar to those described for Alternative 1, especially if exposures associated with construction and use of boat docking facilities or a marina were to occur.

Alternative 4 – Retention of Ownership by DOE; DOE Grants Easement to the Owner of the Boeing Property. Potential impacts would be similar to those described for Alternative 1, especially if installation of boat docking facilities was not restricted.

Alternative 5 – No Action. There would be a smaller chance of exposure under this alternative because human activity within the floodplain strip would be less than under Alternative 1.

4.9 Cumulative Impacts

Previous sections described potential direct and indirect impacts to human health and the environment from the Proposed Action and alternatives. Direct impacts from any of the alternatives would be small, limited to some temporary disturbance (e.g., noise, exhaust emissions) of resources over the short-term associated with clearing brush and building nature trails in the floodplain area and some minor, longer-term disturbance associated with boats and marina operations, if these facilities are actually built. Indirect impacts, those from development of the adjoining Boeing tract, would be more substantial, and could include both negative (e.g., displacement of local wildlife, impacts to water quality from storm runoff and lawn and garden chemicals) and positive impacts (e.g, increased job opportunities, an expanded tax base, higher property values in the area).

In general, cumulative impacts (in this instance, incremental impacts from conveyance of the floodplain strip) would be small. Indirect impacts from development of the Boeing Property would, in most cases, overshadow direct impacts from conveyance of the floodplain strip or render them marginal. For example, development of the Boeing Property could produce measurable short-term impacts to air quality and longer-term impacts to ecological resources, as wildlife would be effectively excluded and the level of disturbance (noise, night lighting, movement of people and vehicles) would be much higher in the area. Under the Proposed Action and alternatives, there could be some additive impacts to local wildlife on the floodplain strip, but they would be imperceptible in most instances. A reduction in the biodiversity of the site area could occur from construction and development, but the effects of this would most likely be confined to the Boeing Property due to the limited planned improvements on the floodplain strip proper. Overall, cumulative impacts on ecological resources of the floodplain strip itself would be minimal.

Cumulative impacts would be very minor for the resource areas of air quality, geology and soils, public health, and floodplains and wetlands. Cumulative impacts on air quality would be associated with construction activities relating to improvements on both the Boeing Property and floodplain strip, but would be of short-term duration during those activities and of limited magnitude. The potential impacts to soils on the floodplain strip would be minimal due to the short-term duration of any construction period for improvements and the small area of land disturbed, and indirect impacts on floodplain strip soils from construction activities on the Boeing Property would be minor. No significant effects on public health from indirect or direct impacts were identified and, thus, cumulative effects on public health under the Proposed Action would be negligible.

DOE does not expect heavy erosion within the floodplain strip due to the limited scale of the planned activities. Consequently, there would be only minimal opportunities for increased runoff and related impacts on floodplains and wetlands. The potential creation of infrastructure (e.g, roadways) as well as lawns, landscaped areas, and gardens on the Boeing Property, however, could result in some increased runoff, but would still likely result in minor indirect impacts. The total areal extent of improvements within the floodplains and

wetlands would be insignificant and most structures would be built outside of these areas. Therefore, cumulative impacts on floodplains and wetlands would be minor.

Cumulative impacts would be noticeable though relatively small in a few resource areas, including aesthetics and cultural and archaeological resources. Depending on the design and placement of buildings and infrastructure within the Boeing Property (see Section 4.3), implementation of the Proposed Action could increase impacts to visual/aesthetic resources as vegetation (underbrush and trees) along the river would be removed to enhance (Boeing) property owners' views. This would have the effect of degrading the viewscape from the opposite direction (the river), however, as the existing landscape would become more suburban-industrial in character and night lighting would become more intrusive.

Implementation of the Proposed Action in conjunction with development of the Boeing Property could make cultural and archeological resources in the area more vulnerable to damage, vandalism, and unauthorized collection of artifacts. Other alternatives (2, 3, and 4) that involve DOE retaining ownership or conveying the floodplain strip to another government entity would offer less potential for degradation of the site's cultural resources.

Cumulative socioeconomic impacts would be largely positive. Conveyance of the floodplain strip would likely increase the value of the Boeing Property and other properties in the general vicinity. It would almost certainly expand the county's tax base and increase tax revenues, to the extent that the Proposed Action makes the Boeing Property more attractive to potential residents and tenants.

As discussed in several previous sections, the floodplain strip and Boeing Property are located in the general vicinity of ETTP, ED-1, and various other commercial and DOE facilities, including upgradient facilities. However, potential impacts from facilities and areas outside of the general vicinity of the site area as they relate to the Proposed Action have been determined to be negligible for all resource areas. Thus, impacts from peripheral and upgradient areas and facilities will have an insignificant contribution to the cumulative impacts to the floodplain strip under the Proposed Action.

5.0 Mitigation Measures and Regulatory Basis

This section discusses possible mitigation actions or activities that can be taken to avoid, minimize, or compensate for anticipated impacts.

5.1 Floodplain and Wetlands

The quitclaim deed would require any construction within the 100-year floodplain to comply with Federal and State laws (Appendix F). Any construction within jurisdictional wetlands as identified in Appendix A must comply with the Department of Army Wetlands Construction Restrictions contained in 33 CFR, Sections 320 through 330, as amended, and any other applicable Federal, State, or local wetlands regulations.

Regulatory bases for floodplain management and wetland protection include:

- 10 CFR 320-320, Department of Army Wetlands Construction Restrictions
- 10 CFR 1022, Department of Energy Compliance with Floodplain/Wetlands Review Requirements
- Executive Order 11990, Protection of Wetlands
- Executive Order 11988, Floodplain Management

5.2 Threatened and Endangered Species

- DOE corresponded with the USFWS (as part of informal consultation under the Endangered Species Act) and TDEC regarding whether or not conveyance of the floodplain strip from Federal control would jeopardize any threatened or endangered species. Appendix C presents this correspondence. USFWS indicated concerns about the potential presence of the Indiana bat and gray bat on the floodplain strip. Because the gray bat nests and hibernates in caves and no impacts to its foraging habitat (open water) are expected, no mitigation activities are needed for this species. Appendix D presents the biological assessment. Potential mitigation options for the Indiana bat include routing of any trails around any area with excellent potential for habitat and construction of boat docking facilities in areas without excellent potential habitat. Any limited vegetation clearing could be conducted in areas without potential for excellent habitat as well. Because Indiana bats would be in caves hibernating during the winter, any limited felling of trees could take place at that time. In

addition, prior to any improvement activities a survey could be conducted for the State-listed species of plants provided by TDEC. Improvement activities could be conducted in a manner that limits or avoids impacts to these plant species.

5.3 Cultural and Archeological Resources

The two eligible archaeological sites (40 RE 86 and 40 RE 89) would be excluded from the property transfer and would remain under Federal ownership. Any existing cemeteries discovered subsequent to the conveyance of the floodplain strip would require protection and could not be relocated. The future owner would be required to provide access to the cemeteries.

Regulatory bases for the identification and protection of cultural and archeological sites include:

- 16 USC 470, National Historic Preservation Act, as amended
- 16 USC 470aa, Archeological Resources Protection Act, as amended
- 25 USC 3001, Native American Graves Protection and Repatriation Act of 1990
- 42 USC 1996, American Indian Religious Freedom Act of 1978
- 61 FR 26771, Executive Order 13007 "Indian Sacred Sites"

5.4 Public Health

The *Record of Decision for the Clinch River/Poplar Creek Operable Unit* (DOE, 1997) describes the human health risks associated with contaminated sediments and biota in Watts Barr Reservoir. The Record of Decision (ROD) was based on sampling and analysis conducted as part of a CERCLA Remedial Investigation/Feasibility Study (RI/FS) for the Operable Unit (OU). DOE-related contaminants were found in proportion to water depth, with little contamination in near-shore sediments. Risks from recreational shoreline use were considered acceptable, as were risks associated with swimming (DOE, 1997).

Also, the CERCLA 120(h) process is used to identify the presence or likely presence of hazardous substances on property being transferred by Federal agencies, and was used to investigate the floodplain strip. The CERCLA 120(h) process requires that the following information sources be used to identify the presence of hazardous substance contamination on government land: historical, aerial photography, and field investigation/verification. Geology, magnetic and gamma anomaly maps were prepared by the Geographic Information Science and Technology Group at ORNL. The shoreline, backwash and wetlands areas were walked over extensively to assure maximum coverage to identify potential

manmade disturbances, disposals of hazardous materials, and other environmental concerns.

Based on the site reviews conducted by TDEC, and as part of the Section 120(h) assessment, TDEC determined that there is insignificant risk to public health as a result of Federal activities near the floodplain strip. TDEC recommended that no sites or facilities evaluated in their study be excluded from the land conveyance due to contamination (TDEC, 2000). DOE (2000a) determined that the human health risks associated with the Proposed Action were negligible under all relevant exposure scenarios. For these reasons, EPA concluded that the floodplain strip is "uncontaminated" under CERCLA Section 120(h)(4)(B). The regulatory basis is the following:

- 42 USC 9601, et seq. Comprehensive Environmental Response, Compensation, and Liability Act

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Acronyms and Abbreviations

AWQS	Ambient Water Quality Standards
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DCG	Derived Concentration Guide
DOE	U.S. Department of Energy
DOE-ORO	U. S. Department of Energy Oak Ridge Operations Office
EDE	Effective Dose Equivalent
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESD	Environmental Sciences Division, Oak Ridge National Laboratory
ETTP	East Tennessee Technology Park
FONSI	Finding of No Significant Impact
FR	Federal Register
LCF	Latent Cancer Fatality
MEI	Maximally Exposed Individual
NAAQS	National Ambient Air Quality Standards
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NERP	National Environmental Research Park

NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
ORLC	Oak Ridge Land Company
ORNL	Oak Ridge National Laboratory
ORO	Oak Ridge Operations
ORR	Oak Ridge Reservation
SHPO	State Historic Preservation Officer
T&E	Threatened and Endangered
TDEC	Tennessee Department of Environment and Conservation
USACOE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
TVA	U.S. Tennessee Valley Authority
VOC	Volatile Organic Compound
WQS	Water Quality Standards

Glossary

26(a) permit: Written approval required under Section 26a of the TVA Act, which must be obtained from TVA prior to construction, operation, or maintenance of boat docks, piers, boathouses, rafts, buoys, floats, boat-launching ramps, fills, non-navigable houseboats, or other such obstructions which may affect navigation, flood control, public lands, or reservations along or in the Tennessee River or its tributaries.

Air pollutant: Any substance in the air that could, if in high enough concentration, harm humans, other animals, or vegetation.

Air quality standards: The level of pollutants in the air prescribed by regulation that may not be exceeded during a specified time in a defined area.

Ambient air: That portion of the atmosphere, external to buildings, to which the general public is exposed.

Ambient water quality standards: The level of pollutants in water, prescribed by regulations, that may not be exceeded during a specified time in a defined area.

Archaeological site: Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.

Area of interest: Any site that has been identified by the State of Tennessee as possibly contaminated with cesium.

Benthic: Occurring at the bottom of a body of water.

Biodiversity: Biological diversity in an environment as indicated by numbers of different species of plants and animals.

Cesium: A silver-white alkali metal. A radioisotope of cesium-137, is a common fission product.

Code of Federal Regulations (CFR): AN U.S. government publication containing the full range of Federal regulations in codified form.

Community (biotic): All plants and animals occupying a specific area under relatively similar conditions.

Colluvium: Soil material and/or rock fragments moved by creep, slide, or local wash and deposited at the base of steep slopes.

Conifers: Evergreen trees having needles or scalelike leaves.

Criteria pollutant: Six air pollutants [sulfur dioxide, nitric oxides, carbon monoxide, ozone, particulate matter-10 (smaller than 10 microns in diameter), and lead] for which National Ambient Air Quality Standards are established by the U.S. Environmental Protection Agency.

Cultural resource: Any prehistoric or historic site, building, structure, district, or other place or object (including biota of importance) considered to be important to a culture, subculture, or community for scientific, traditional, or religious purposes or for any other reason.

Curie: The conventional unit of activity in a sample of radioactive material. The curie is equal to 37 billion disintegrations per second; which is approximately the rate of decay of 1 gram radium; also a quantity of any nuclide or mixture of nuclides have 1 curie of radioactivity.

Derived concentration guide (DCG): The concentration of a radionuclide in air or water that under conditions of continuous exposure for 1 year by one exposure mode (e.g., ingestion of water, submersion in air, or inhalation of air) would result in an effective dose equivalent equal to the annual dose limit for the group exposed. For the public, this would be a dose of 100 millirem to a reference human who inhales 8,400 cubic meters of air and ingests 730 liters (771 quarts) of water in a year.

Direct impacts: Effects, which are caused by the action and occur at the same time and place (40 CRF Part 1508.4).

Dose: A generic term that expresses the energy absorbed by a unit of mass of material exposed to ionizing radiation (absorbed dose in units of rad or gray) or the product of a quality factor and the energy absorbed by human tissue exposed to ionizing radiation (dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent). In this EA, dose means effective dose equivalent as defined in this glossary.

Drawdown: Area of reservoirs exposed between full summer pool and minimum winter pool levels during annual drawdown of the water level for flood control.

Edge: The junction of two different habitats, such as forest and grasslands.

Effective dose equivalent (EDE): The sum of the products of the dose equivalent to an organ or tissue and the weighting factor applicable to each organ or tissue irradiated.

Embayment: A bay or arm of a reservoir.

Endangered species: Plants and animals that are threatened with extinction, serious depletion, or destruction of critical habitat. Requirements for declaring a species endangered are contained in the Endangered Species Act.

Environment: The sum of all-external conditions and influences affecting the life, development, and ultimately the survival of an organism.

Environmental Assessment (EA): A document required of Federal agencies by the National Environmental Policy Act to aid it in making a significance determination. Either a Finding of No Significant Impact (FONSI) or an environmental impact statement must follow an EA.

Environmental Impact assessment (EIS): A document required of Federal agencies by the National Environmental Policy Act for proposals for legislation or major Federal actions significantly affecting the quality of the human environment. A tool-for decision-making, it describes the positive and negative environmental impacts of a proposed action and its alternative actions.

Erosion: A general term for the natural processes by which earth materials are loosened, dissolved, or worn away and moved from one place to another. Typical processes are wind and water as they carry away soil.

Finding of No Significant Impact (FONSI): A determination under the National Environmental Policy Act that a proposed Federal action does not significantly effect the man-made or natural environment.

Floodplain: The lowlands adjoining inland and coastal waters and relatively flat areas including at a minimum that area inundated by a 1-percent or greater chance of flood in any given year.

Flowage easement: Privately owned lakeshore properties where TVA has the right to flood the land as part of its reservoir operations. TVA also has permitting responsibility for proposed docks and other shoreline structures.

Formation: In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

Fragmentation: The process of breaking up a large area of relatively uniform habitat into one or more small, disconnected areas.

Geology: The science that deals with Earth: the materials, processes, environments, and history of the planet, including the rocks and their formation and structure.

Groundwater: Water found beneath the Earth's surface.

Habitat: The part of the physical environment in which a plant or animal lives.

Hardwoods: Trees, which shed their leaves at the end of the growing season.

Heavy metals: Metallic or semimetallic elements of high molecular weight, such as mercury, chromium, cadmium, lead, arsenic, that toxic to plants and animals at known concentrations.

Historic resource: The sites, districts, structures, and objects considered limited and nonrenewable because of their association with historic events, persons, social, or historic movements.

Hydric Soils: A soil that is saturated, flooded, or ponded long enough during the growing season to develop oxygen deficient conditions in the upper part.

Hydrophytic vegetation: Plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Indirect impacts: Effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR Part 1508.4).

Mitigation: The alleviation of adverse impacts on resources; by avoidance, by limiting the degree or magnitude of an action, by repair or restoration, by preservation and maintenance that reduces or eliminates the impact, or by replacing or providing substitute resources or environments.

National Ambient Air Quality Standards (NAAQS): Air quality standards established by the *Clean Air Act*, as amended. The primary NAAQS are intended to protect the public health with an adequate margin of safety, and the secondary NAAQS are intended to protect the public welfare from any known or anticipated adverse effects of a pollutant.

National Emission Standards for Hazardous Air Pollutants (NESHAP): A set of national emission standards for listed hazardous pollutants emitted from specific classes or categories of new and existing sources. These standards were implemented in the *Clean Air Amendments of 1977.*

National Environmental Policy Act (NEPA): Legislation signed into law in 1970 which, among other provisions, requires U.S. government agencies to prepare environmental reviews on proposed polices, procedures, plans, approvals, and other proposed Federal actions.

National Historic Preservation Act (NHPA): Congress passed the NHPA in 1966. The law established a national policy for the protection of historic and archaeological sites and outlined the responsibilities of Federal and state governments in preserving our nation's history.

National Pollutant Discharge Elimination System (NPDES) permit: The NPDES is a regulatory program (regulated through the *Clean Water Act*, as amended) of either the U.S. Environmental Protection Agency or state EPA-authorized agency that is designated to control all discharges of pollutants from point sources to U.S. waterways. NPDES permits regulate discharges into navigable waters from all point sources of pollution, including industries, municipal treatment plants, large agricultural feed lots, and return irrigation flows

National Register of Historic Places (NRHP): A list of districts, sites, buildings, structures, and objects of prehistoric or historic local, state, or national significance maintained by the Secretary of the Interior.

Native American: For purposes of this document, a Native American is defined as a tribe, people, or culture that is indigenous to the United States. Also referred to as American Indians.

Nutrient enrichment. The addition of excessive nutrients above those naturally found in water systems.

Open space: A land use category applied to areas that exist in a predominantly natural, undeveloped state.

Parent material: The unconsolidated mass of rock material from which the soil profile develops.

Particulates: Solid particles and liquid droplets small enough to become airborne.

Permeability: Ability of liquid to flow through rock, groundwater, soil, or other substances.

Person-rem: Unit of radiation dose to a given population. The sum of the individual doses received by a collection of individuals.

Prehistoric: Of, relating to, or existing in times antedating written history.

Radiation: The particles or electromagnetic energy emitted from the nuclei of radioactive atoms. Some elements are naturally radioactive; others are induced to become radioactive by bombardment in a reactor.

Radioactivity: The spontaneous decay or disintegration of unstable atomic nuclei, accompanied by the emission of radiation.

Radionuclide: Any radioactive element.

REM (Roentgen equivalent man): The conventional unit of radiation dose equivalent. A unit of individual dose of absorbed ionizing radiation used to measure the effect on human tissue. The dosage of an ionizing radiation that will cause the same biological effect as one roentgen of X-ray or gamma ray exposure.

Riparian: On or around rivers and streams.

Runoff: The portion of rainfall, melted snow, or irrigation waters that flows across the ground surface and may eventually enter streams.

Shoreline: The line where the water of a TVA reservoir meets the shore when the water is at the normal summer pool elevation.

Silt: A sedimentary material consisting of fine mineral particles intermediate in size between sand and clay.

Socioeconomic: The social and economic conditions in a study area.

Substrate: The base or material to which a plant is attached and from which it receives nutrients.

Surface water: Water on Earth's surface, as distinguished from water in the ground (groundwater).

Threatened and endangered species: Animals, birds, fish, plants, or other living organisms in jeopardy of extinction by human-produced or natural changes in their environments.

Understory: Saplings, shrubs, forbs, and other low-growing vegetation present in a forest.

Unrestricted Use: Use of conveyed property consistent with appropriate laws and deed restrictions.

Volatile organic compounds (VOCs): A broad range of organic compounds, often halogenated, that vaporizes at ambient or relatively low temperatures. They include compounds such as benzene, chloroform, and methyl alcohol.

Wetland: Land or areas exhibiting hydric (requiring considerable moisture) soil concentrations, saturated or inundated soil during some portion of the year, and plant species tolerant of such conditions.

Wetland hydrology: Permanent or periodic inundation or prolonged soil saturation sufficient to create oxygen depleted conditions in the soil.

Appendix A - Floodplain/Wetlands Assessment for the Floodplain Strip Adjoining the Boeing Property

Floodplain/Wetlands Assessment for the Floodplain Strip Adjoining the Boeing Property

Pursuant to 10 CFR Part 1022,12 (2)(b), this appendix provides an assessment of the potential effects of transferring an approximately 182-acre tract of U.S. Department of Energy (DOE) controlled property on its floodplain and wetland values. Floodplain and wetlands are defined in 10 CFR Part 1022 (4). Floodplain and wetland values for the tract are evaluated against the guidance in 10 CFR Part 1022 and DOE's *Guidance on Environmental Requirements for DOE Real Property Transfer* (DOE/EH-413/9712). It is also the Department's policy to perform actions in a manner so as to avoid or minimize potential harm to or within affected floodplain and wetlands in accordance with 10 CFR Part 1022, E.O. 11988 and E.O. 11990. The property transfer would be from DOE to the abutting Boeing Property owner (the Proposed Action), to TVA, or to the City of Oak Ridge or Roane County. Other alternatives include retention of ownership by DOE with DOE granting easements to the abutting landowner, and the No Action alternative. Issues with the archaeological sites, threatened and endangered species habitat, and legacy radiological contamination in the general site area are identified with respect to potential mitigation actions required to preserve or minimize the potential effects of the action upon floodplain and wetland values. Floodplain/wetland values include recreational access, nature study, aesthetic or scenic views, natural functions as habitat for plants and animals, flood control, groundwater discharge or recharge, and land nutrient retention and removal.

A.1 Project Description

The Proposed Action is for DOE to convey a strip of floodplain adjoining the Boeing Property to the abutting landowner. The alternative associated with the Proposed Action involves recreational use with or without boat docking facilities, respectively. This land comprises the low-water line inward. The floodplain strip totals about 182 acres of land. The area is designated as Campbell Bend and is situated between the waters of Roberts Branch and Johnson Creek. The site area is biologically diverse with a range of habitat types (bottomland hardwood, wetlands, pine plantations, and old-field successional areas).

The floodplain strip is currently a part of DOE's Oak Ridge Reservation (ORR), which is located in Roane and Anderson counties in East Tennessee, mostly within the corporate limits of the City of Oak Ridge. The floodplain strip covers approximately 5 miles of shoreline along the Clinch River. The width of the floodplain strip, from the water's edge at normal summer pool level (741 feet) to the 750-foot contour, varies from about 100 feet at approximately River Mile 12.5 to just over 3,000 feet at Roberts Branch. The average width of the floodplain strip is about 650 feet. However, it should be noted again that for the purposes of this proposed conveyance, the floodplain strip is from the low-water line inward to the Boeing Property. The Clinch River drains into the Tennessee River and is part of Watts Bar Reservoir. Figure 1 shows the DOE property proposed for transfer and the 500- and 100-year floodplain. Figure 2 shows the wetland and

floodplain boundaries. All cited figures and photos can be found following the text of this document.

DOE would convey the floodplain property for use as green space consistent with the *Segment O Master Plan* (ORLC, 1999). Improvements to the floodplain property could include the following under Alternative 1, the Proposed Action of Conveyance of the Property to the Abutting Landowner for Unrestricted Use:

- Placement of a limited number of natural surface walking paths and paved surface roads to facilitate access to the waterfront in a few select locations, and also benches and picnic tables.

- Removal of fallen timber and excessive undergrowth in selected locations to improve waterfront views and mountain vistas (ORLC, 2000).

- Development and installation of TVA-authorized boat docks and possibly a marina to support community-wide recreation could also occur. Community use facilities would likely be developed near the bridge crossing the Oak Ridge Turnpike.

DOE was contacted by the Boeing Corporation to consider conveyance of the floodplain strip adjacent to property owned by the Boeing Corporation. Boeing had provided a developer with an option to purchase its property. Due to the location and size of the floodplain strip (which is noncontiguous to the Oak Ridge Reservation) DOE determined that it had no programmatic need for the property, and that it was therefore appropriate to consider release of the property from federal ownership. In recognition of the potential economic benefits to the region of further development, DOE agreed to consider conveyance of the floodplain strip for development along with other alternatives. The purpose of Environmental Assessment is to form the basis of any decision with respect to conveyance of the floodplain strip and to inform the public.

In March 2000, a wetland delineation of the floodplain strip was conducted. Of the 182-acre tract, approximately 69 total acres are wetlands. Details of the wetland delineation can be found in TtNUS, 2000. Wetlands were delineated in three geographic areas within the floodplain strip, Johnson Creek, Campbell Bend, and Roberts Branch. Wetlands occurring along Johnson Creek, Campbell Bend, and Roberts Branch are typical Palustrine system wetlands composed of forested wetlands (mainly bottomland hardwoods) and emergent wetlands (mainly persistent emergent wetlands with a dominance of common cattails, bulrushes, and sedges). Portions of the wetlands within each area have Lacustrine habitat features resulting from their existence within the floodplain. Areas within Campbell Bend and Roberts Branch have some atypical or man-induced characteristics.

The total areal extent of the wetlands was estimated to be about 69 acres or approximately 38 percent of the 182-acre floodplain strip. The wetlands in the Johnson Creek and Campbell Bend areas are entirely within the 100-year

floodplain. A very small portion of the Roberts Branch wetland occupies the 500-year floodplain.

Johnson Creek. This area contains wetland vegetation dominated by sycamore, American elm, red maple, hackberry, green ash, box elder, and smooth alder. Bulrushes and common cattails dominate one small persistent emergent wetland. The headwater of Johnson Creek is limited to old depositional areas at the mouth of the creek where it enters the lake (Photo A-1). The topographic gradient of Johnson Creek is relatively steep and not influenced by the backwater created by higher lake levels. No atypical, man-altered, or disturbed areas were identified. Total land area meeting the criteria for a wetland is approximately 2 acres.

Campbell Bend. This area contains wetland vegetation dominated by sycamore, American elm, red maple, hackberry, green Ash, and box elder. River birch and black willow were found in two quadrants. One small persistent emergent wetland dominated by bulrushes and common cattails was present. The Campbell Bend wetlands receive groundwater by springs and seeps from upland recharge areas and from the influences of the Clinch River evident near the tip of the bend. Areas along the eastern and southeastern portions of Campbell Bend contain atypical man-induced characteristics that may have resulted from the hydrological changes to the area after the creation of Watts Bar Dam and the formation of Watts Bar Lake. The area contained many dead loblolly pines – both standing and downed (Photo A-2). Total land area meeting the criteria for a wetland is approximately 19 acres.

Roberts Branch. This area contains wetlands comprised primarily of bottomland hardwoods (Photo A-3) and emergent wetlands (Photo A-4). Adjacent uplands consist of American beech, red oak, and christmas ferns. An emergent wetland dominated by common cattails can be seen in the interior of the Roberts Branch area. This cattail marsh was the only persistent emergent wetland identified in the 500-year floodplain that was not directly associated with immediately adjacent riverine deposits. The topography of Roberts Branch is relatively flat and lake levels more closely influence the hydrology of these riparian wetlands. A minor influence to the hydrology of the Roberts Branch wetland is a dirt road built up through bottomland hardwoods. At the terminus of this road a bridge once existed leading across the peninsula. An existing culvert alters the drainage patterns in the backwaters of Roberts Branch. Backwater flooding from the Clinch River supplies most of the water to these wetlands. Total land area meeting the criteria for a wetland is approximately 48 acres.

A.2 Floodplain/Wetland Effects

This section presents the potential effects of transferring the floodplain strip to the owner of the abutting property when DOE is ready to divest itself of the holding and, thus, focuses primarily on the Proposed Action. Based on the proposed limited, planned improvements in the floodplain and types of subsequent activities that could occur, DOE does not believe there would be any hazards to the public

or property from flooding, nor would the activities jeopardize the wetland's survival, quality, and natural beneficial values.

Positive/Negative Effects. A positive benefit of transferring the floodplain strip to the abutting landowner (the Proposed Action) is that it would add some value to the adjoining Boeing Property in terms of green space and recreational opportunities for the residents of the development. A negative effect of the transfer is that potentially threatened and endangered species habitat would no longer be under Federal control. In general, there would be a reduction in the area's biological diversity because of the land clearing associated with development of the Boeing Property. Additionally, some wildlife dislocations could be expected because of the presence of humans and domestic animals.

Direct/Indirect Effects. DOE does not believe the action of conveying the floodplain strip of property to the purchaser of the Boeing Property would result in any discernible direct impact to the natural functional values of the floodplain and its associated wetlands. While indirect effects could occur from the development of the adjoining Boeing Property, the magnitude of the impacts would be small.

Long- and Short Term Effects. In the long-term, DOE does not anticipate any discernible impacts to the floodplain strip. Currently, the property is in an undeveloped natural state and is a biologically diverse area comprising part of the Oak Ridge Reservation's National Environmental Research Park. The transfer of the land would not alter the natural character of the floodplain strip because the intent of the proposed purchaser is to maintain the floodplain strip for recreational use. Due to the proximity of the floodplain strip to the proposed Boeing Property, however, the presence of humans and domestic animals would result in long-term increased use of the property. This presence can increase the chance of some users harming the archaeological sites and for domestic animals preying on wildlife. Potential dock and/or marina construction could enhance the quality of the fish population in the long-term. However, unrestricted use of the floodplain strip, including construction of roads, buildings, and infrastructure, could result in some cumulative impacts to the floodplain strip (though they are expected to be minor).

In the short-term, the floodplain strip could be indirectly affected by construction activities on the Boeing Property. Short-term, sporadic fugitive dust and soil erosion, vehicle emissions, and disturbances to the river substrate from dock construction could affect the floodplain strip. Cumulative impacts from this activity on the floodplain strip and concurrent development on the Boeing Property would likely be minimal.

Effect on lives and property. Because the limited improvements planned for the property would be small in scale and be nature or recreationally oriented, there would be no habitable structures within the floodplain or wetlands that could present a hazard or flooding risk. Similarly, the potential exposure from legacy radiological contamination would be small.

No habitable structures are planned to be located near the contaminated areas that are underwater most of the year. The hypothetical bounding exposure to an individual would be 90 millirem per year. This conservative exposure estimate assumes an individual lives on the contaminated location year-round. Given intermittent recreational use of an area for up to 500 hours per year, the estimated external dose to the individual would be much less, about 5 millirem per year.

A.3 Alternatives

Section 2.0 of the *Floodplain Strip EA* describes the Proposed Action and alternatives. Due to the loss of DOE ownership of the floodplain strip under all of the alternatives but the No Action Alternative and retention by DOE with easements granted to the abutting landowner, potential adverse impacts can be anticipated for some on-site resources. The quitclaim deed could define restrictions that could be implemented to ensure long-term protection. Additionally, any proposed structure in the floodplain would be subject to TVA's Section 26(a) review. This review includes consideration of potential adverse impacts on navigation, flood control, public lands and reservations, power generation, wetlands, threatened and endangered species, and cultural resources.

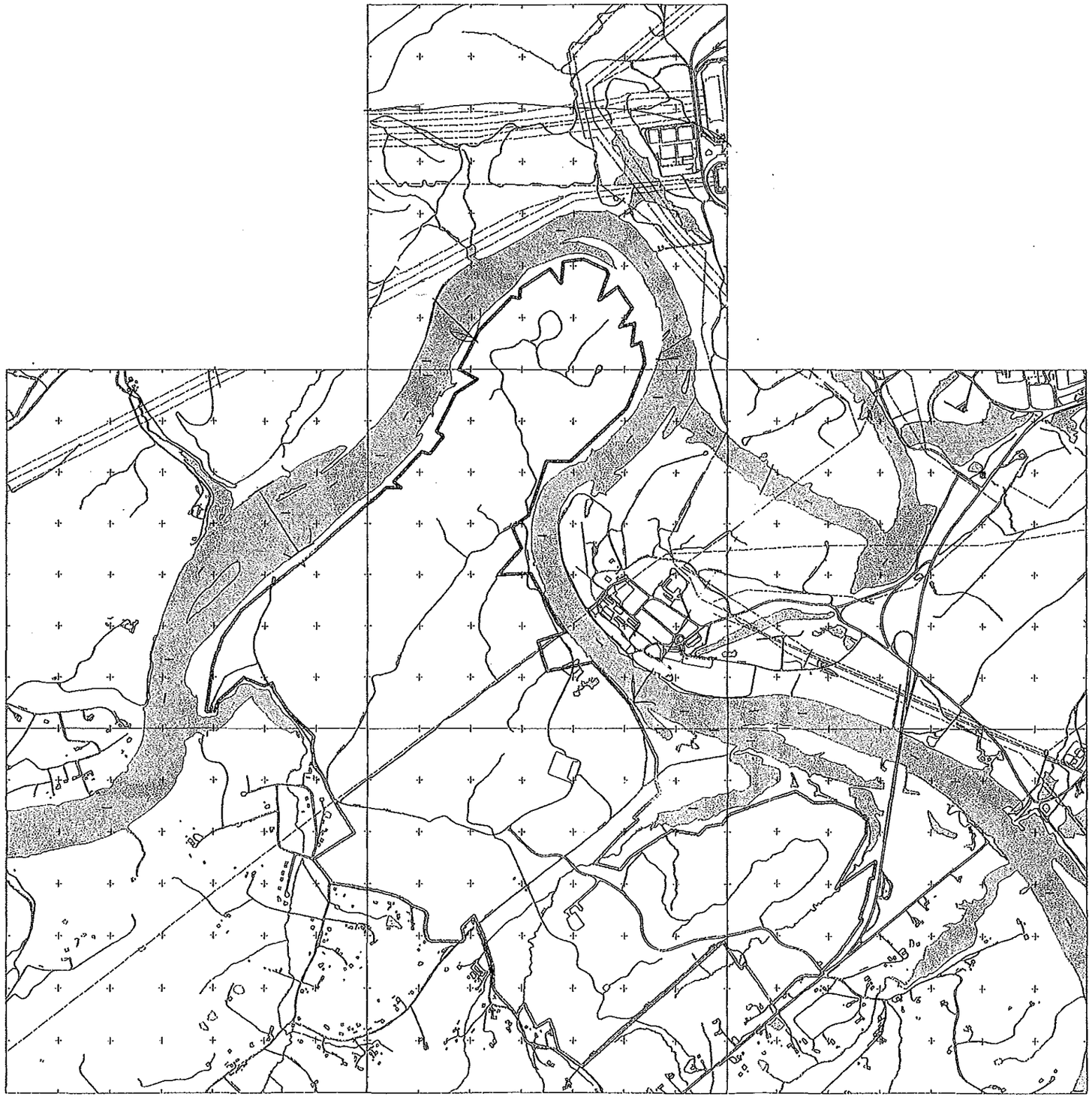
References

ORLC (Oak Ridge Land Company), 1999. *Segment O Master Plan*, Oak Ridge, Tennessee

ORLC (Oak Ridge Land Company), 2000. *Proposal to Prepare a Focused Environmental Assessment of the Floodplain Strip Adjoining the Boeing Segment O Property*, Oak Ridge, Tennessee

TtNUS (Tetra Tech NUS, Inc.), 2000. *Wetland Delineation Report: 500-Year Floodplain, Segment O Site, U.S. Department of Energy – Oak Ridge Reservation, Roane County, Tennessee*, TtNUS Offices in Oak Ridge, Tennessee and Aiken, South Carolina

Figures and Photos



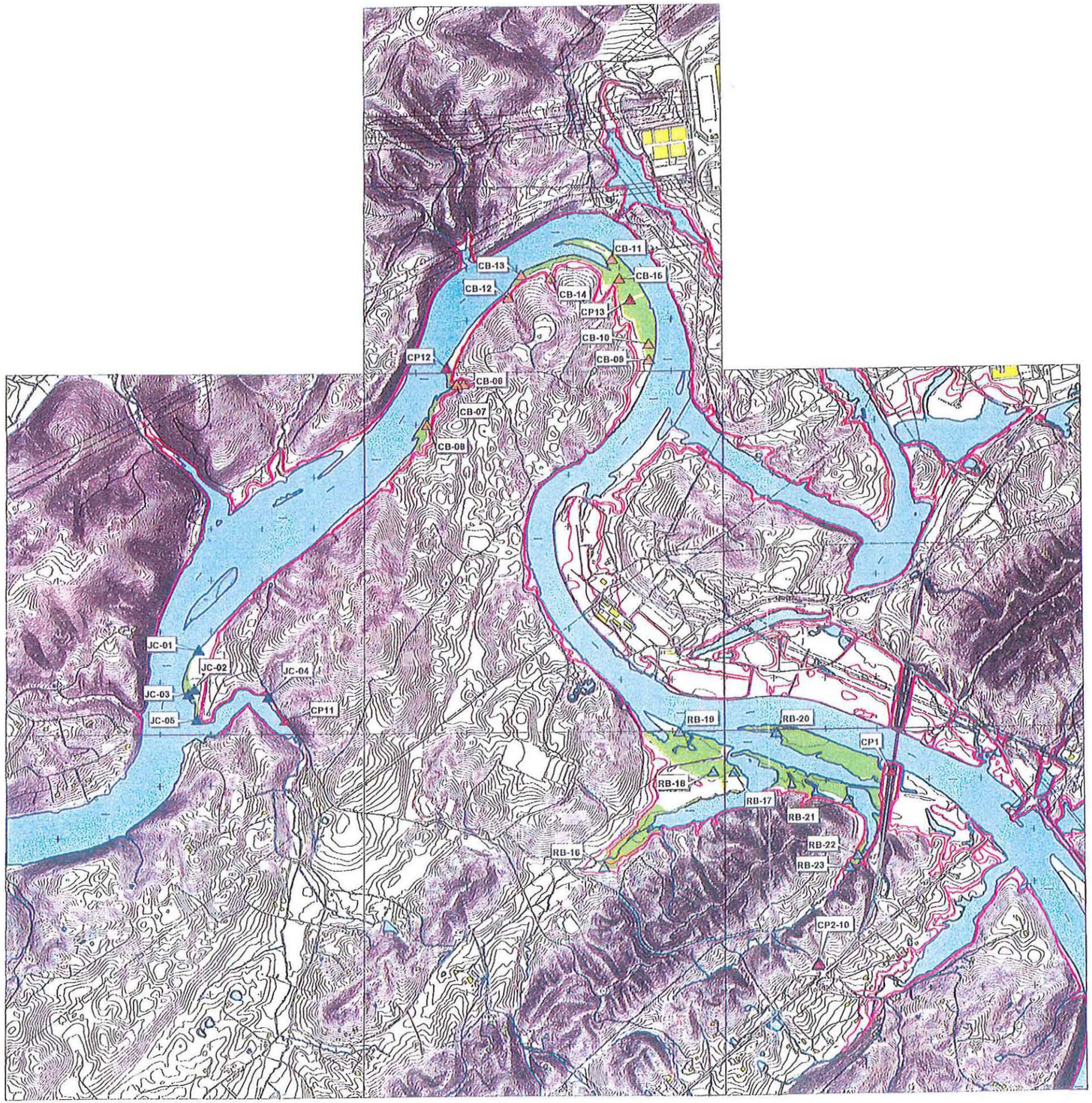
N

DOE Boundary

2000 FT 0 FT 2000 FT 4000 FT

Tetra Tech NUS, Inc.
AIKEN, SOUTH CAROLINA

FIGURE 1.
DOE BOUNDARY



N

Survey Points

- Control Point
- Campbell Bend Quadrat
- Johnson Creek Quadrat
- Roberts Branch Quadrat

Wetlands

100 & 500 Year Flood Plain

2000 FT 0 FT 2000 FT 4000 FT

Tetra Tech NUS, Inc.

AIKEN, SOUTH CAROLINA

FIGURE 2.
WETLAND AND FLOOD PLAIN BOUNDARY

Photo A-1. Mouth of Johnson Creek and Clinch River (Watts Bar Lake).

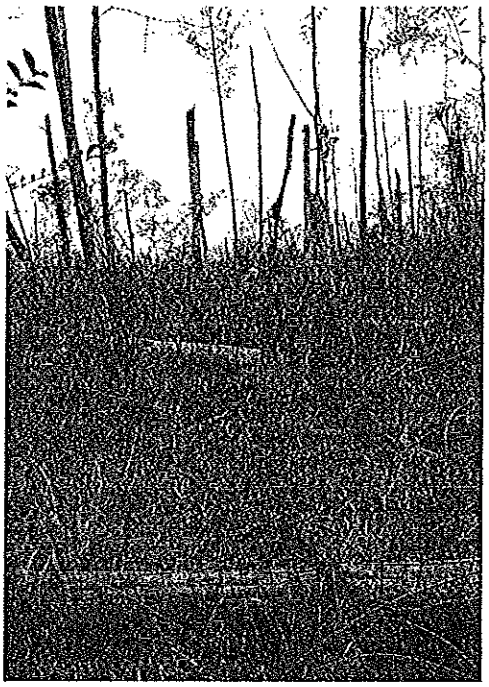


Photo A-2. Downed pines and snags on Campbell Bend.

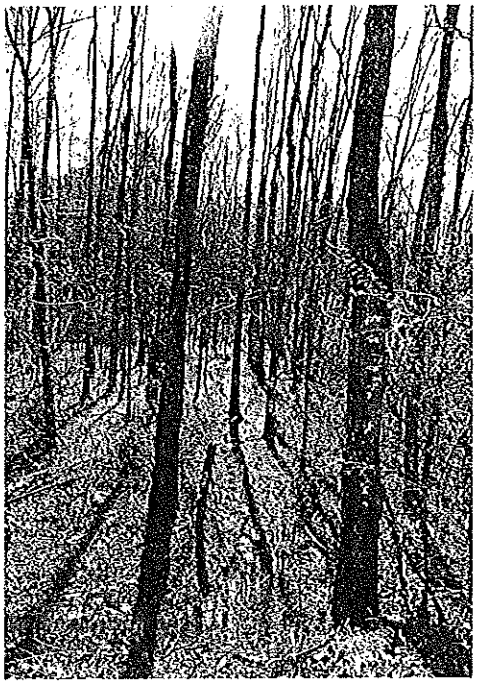


Photo A-3. RB-18 (bottomland hardwoods).

Photo A-4. Emergent wetland in Roberts Branch area (approximately 250 feet south of RB-19).

Appendix B – Summary of Field Investigations

TDEC DOE-OVERSIGHT DIVISION

ENVIRONMENTAL RESTORATION
FOOTPRINT REDUCTION PROCESS

EVALUATION OF THE BOEING FLOODPLAIN STUDY AREA

MARCH 2000

8. FIELD INVESTIGATION MATERIALS AND METHODS:

8.1 INTRODUCTION AND SCOPE:

The Tennessee Department of Environment and Conservation (TDEC), Department of Energy Oversight Division surveyed the study area identified as the Boeing floodplain study area of the Footprint Reduction Project for negative environmental impacts associated with federal activities on the Oak Ridge Reservation (ORR).

A proposal to identify portions of the ORR that have been environmentally unaffected by federal activities was submitted to TDEC in March 1996. The purpose was to determine which land parcels could be unconditionally released from CERCLA requirements and to reduce the size and configuration of the area of the ORR designated as part of the NPL site.

Historical investigations, aerial photography analysis, and remote sensing analyses were studied for evidence of federal activities that could have potentially resulted in adverse impacts to the environment. Magnetic and radiological anomalies were plotted on maps to assist the field investigation team. TDEC conducted the field investigation with logistical support from DOE and the Geographic Information Science and Technology group (GIST) of ORNL.

TDEC took radiological readings and inspected selected locations throughout the study area and adjoining parcels to determine if any contamination from DOE (or its predecessors) could be detected. Contamination can be in the form of solid waste, radiological waste, or hazardous waste. Groundwater contamination will be addressed in detail if the property is released to the public.

TDEC investigated magnetic and gamma anomalies and other features identified in the field. Cultural changes, nonsequential vegetation changes, radiological anomalies, and geophysical anomalies were investigated. Karst features, abandoned and existing roads and structures, and other areas were inspected during the field investigations.

8.2 MATERIALS AND METHODS

Procedures employed during this project are consistent with those contained in the TDEC/DOE-O Workplan for the Walkover Survey Program.

The survey team consisted of Robert Storms and Gerry Middleton. Mike Coffey of CDM Federal was assigned by ETTP to provide logistical support. The team used a Ludlum Model 2221 Scaler Ratemeter with a 2 x 2 inch sodium iodide (NaI) detector. Three, 1-minute counts were performed at each survey point.

Findings are reported in counts per minute (cpm). It should be noted that if radiological

contamination is detected, TDEC has a micro-rem meter that provides data in tissue dose equivalent units (rem), TDEC also uses a portable gamma spectrometer to determine isotopes involved in a radiologically-contaminated site.

Background levels are geologically and geographically dependent. Therefore, an arbitrary threshold value of twice areal background was established. Readings above that number will be noted as anomalous and background readings and measurements for the specific area will be taken.

TDEC reviewed available DOE, LMES, and BJC LLC historical data (including data available on the internet), as well as all pertinent hard copy information from the TDEC DOE-Oversight files. The size and topography of the site precluded the use of grid survey techniques, and after deliberation it was decided to concentrate on magnetic and gamma anomalies and area surveying.

TDEC selected field routes that would ensure maximum coverage of the area. All roads and trails were investigated to determine if materials were dumped on remote areas of the site.

Magnetic anomalies were examined to ensure that there were no observable structures, waste containers, scrap metal, etc. at the prescribed location.

Remote areas were investigated on foot to determine if these lands were impacted or disturbed by federal activities.

The TDEC field investigation team used a combination of map-reading and Global Positioning Systems (GPS) navigation techniques and radiological instruments to evaluate particular points within the study area. Every reasonable effort was made by the TDEC field investigation team to locate themselves in the field as accurately as possible to the prescribed locations of the magnetic and gamma anomalies.

Coordination for site access was arranged with BJC LLC and ETTP. Personnel from CDM Federal were notified when TDEC personnel were on-site. Permission was granted from Boeing to gain access to the property.

GPS field data correction, basemapping, mapping of anomalies inferred from remote sensing imagery, and aerial photography support were provided by the Geographic Information Science and Technology Group (GIST) as part of the Geospatial Support Program of Environmental Restoration.

9. TDEC SITE FINDINGS AND FIELD INVESTIGATION SUMMARY:

9.1 RESULTS AND DISCUSSION

Data are provided in units of cpm (see field data in Table 4). The scaler ratemeter is calibrated so that for cesium-137, 1,000 cpm = 1uR/hr. Because the actual radionuclides detected are unknown, this information can serve only as a point of reference, not as a conversion factor.

TDEC teams located the pre-mapped anomalies in the field utilizing GPS technology and map-reading skills. Gamma radiation measurements in counts per minute were taken using a Ludlum sodium iodide scaler ratemeter at each anomalous site or obvious point.

Other points were selected on a random or functional as-needed basis. The NaI instrument readings recorded on the study area ranged from a low of 4,422 cpm at TDEC field survey station #9 to a high of 18,420 cpm at TDEC field station #20. Isolated readings as high as 22,000 cpm were detected near field survey stations #38 and #46. Table 4 contains the NaI field readings, site descriptions and their respective locations as determined by the GPS. During the field inspection several man-made disturbances were encountered such as an abandoned quarry, gravel service roads, cleared areas for construction of missile production plant facilities, concrete and asphalt rip-rap piles along shoreline, debris and soil piles, pine reforestation areas, and abandoned scrap metal or discarded metallic (household) objects. Although TDEC identified 8 locations having twice gamma radiation background, no gamma readings were recorded on the study area which were a cause for immediate concern. TDEC collected sediment samples at four of these locations as shown on Figure 6 (see Figure 4 for site descriptions). It should be noted that the field survey work was done in January and February when the Watts Bar reservoir was at low lake stage exposing a lot of shoreline and backwater areas to survey that would normally be inundated. The highest readings recorded (20,000-22,000 cpm range) in the study area were isolated occurrences mainly in the gamma fly-over areas of interest (AOIs). The DOE-signature Cs-137 radionuclide was determined to be the radioisotope of concern associated with these sites. This was determined with onsite gamma spec analysis and confirmed with sediment sample analysis (see Appendix A for TDEC laboratory data). It is probable that the Cs-137-contaminated sediments migrated downstream from releases at White Oak Dam during flooding events, then accumulating in backwater, island tail-water, and sand bar areas along the Clinch River(Watts Bar reservoir) channel.

TDEC conducted an extensive field investigation of the shoreline and associated wetlands areas, still under DOE control (around the Campbell Bend along the Watts Bar reservoir), from approximately Clinch River mile 9.2 (Johnson Creek) to Clinch River mile 14.0 (Gallaher Bridge).

Research of bibliographic resources revealed some groundwater monitoring data from wells developed during the TSA evaluation of the property. These wells have since been plugged and abandoned. The data indicated hits of gross alpha and gross beta in wells

OR-05, 10D, 12 C, 14, and 17A (see Figure 8 – Well Locations). An in depth review of groundwater was not within the scope of this survey. However, see Section 3.3 of this report for more detailed information in regard to well data.

TDEC investigated two areas identified as gamma anomalies (see Figure 2 for locations) by the ORNL Geographic Information Science and Technology (GIST) Group. Gamma anomaly one, located at the apex of Campbell Bend along a sand bar, is associated with Cs-137 contaminated sediments and possible gamma shine (which extends across the river to this vicinity) from the UF6 cylinder yards at K25. Gamma readings taken with the NaI instrument within this area only averaged 12,500 cpm (a few isolated spots yielded spikes of 16,000 cpm). Gamma anomaly two is associated with Cs-137 contaminated sediments along a backwater sand bar area adjacent to Highway 58 bridge. Table 5 – Anomaly Resolutions addresses the causes for these anomalies (as determined by the TDEC field investigation).

Six magnetic anomalies (see Figure 2 for locations) were discovered with an aerial survey (magnetic resonance) provided by the ORNL Geographic Information Science and Technology (GIST) Group. Table 5 – Anomaly Resolutions addresses the causes for the magnetic anomalies on the property and the study area (as determined by the TDEC field investigation).

TDEC located the foundation and associated debris of the J. A. Jones buildings, which were located near the Gallaher Ferry site. Two of the structures actually had official building numbers: 550 (pass office & clock house) and 500 (personnel building) as shown on J. A. Jones general layout drawing 202024 dated 1946 (Milton Stanley, February 23, 2000, personal communication). The buildings were razed and this site is now covered in a pine plantation. The historical aerial photographs, dated 1944-47, taken of this site show five or six structures(see Appendix E Historical Photos 1-5). Two of the structures appear to be long barracks-type buildings. It appears from study of additional historical aerial photos of the study area, the property, and the west side of K-25 Plant, that these structures were demolished about the same time the S-50 facility was dismantled in the late 1940's or early 1950's. Although the exact purpose of these structures is unknown, there was probably some connection to the Gallaher Ferry, the S-50 Site, and/or quarry operations.

TDEC noted extensive forestry operations in the northern portion of the study area. Pine beetle infestation has resulted in some areas being clear cut, while past reforestation has resulted in pine thickets for other areas.

TDEC noted several well-defined sinkholes, dolines, a blue-hole spring, and a few swallets developed in the carbonate limestone formations (Nashville, Stones River and Knox Groups) underlying the heights and lowland topography of the Boeing floodplain study area. The ridge line, just north of the entrance to the property, is underlain by Rome Formation shales, sandstones and siltstones.

During field investigations, TDEC located several home sites adjacent to the study area,

from the era prior to federal activities on the ORR. These were mostly in ruins and only foundation and chimney rubble, tin roofing, domestic plants, glass jars, rusting pots, etc. remain as evidence of a bygone era. Descriptions of these homesteads can be found in Table 4: TDEC Field Survey Data.

TDEC found some evidence of pre-historic habitation along the shoreline of the Boeing study area in the form of lithic (flint-knapping) chips and flakes. There are five pre-historic sites located on the Boeing property. One of these sites, 40RE86, is under consideration for listing on the National Register of Historic Places. For cultural resource protection reasons, these four locations are not shown on Figure 3 – Historical Investigation Map of the Boeing Property. Refer to the Fielder archaeological survey (ORNL-TM-4694) listed in the bibliography for more information.

TDEC identified no additional threatened and endangered plant species (State or Federal-listed) during the course of the field investigation. However, the area was surveyed during the latent growing season of January and February. Previous rare plant surveys of this site revealed the presence of several State-listed threatened and endangered species. Of particular note is the Crowder Cemetery Cedar Barrens plant community (see Table 3 – Vascular Plant Species). There are two species found here that are extremely rare in Tennessee: *Tomanthera auriculata* (a rare figwort thought to be extirpated) and *Solidago ptarmicoides* (first report of this plant for Tennessee). For rare plant species protection reasons, locations are not shown in this report. Refer to the bibliography for rare plant survey information.

During the investigation, the TDEC field team detected gamma radiation above twice background at eight shoreline and backwater locations ranging from 15,000-22,000 cpm. Background was established at approximately 7,500 counts per minute based on a survey of the Clinch River shoreline conducted by the State in 1997. The location of these areas can be seen on figure seven as 20, 31, 38, 40, 41, 46, 50, and 63. Of the locations detected, some were in the general vicinity of each other. For this reason TDEC focused on the major contributors. The areas of topic are listed on figure 6 as locations 20, 31, 41 and 63. The field team used a portable gamma spectroscopy to identify the radioisotope as Cesium 137. The most probable source is sediment released from White Oak Dam, located up river from the study area. Soil samples from these locations were sent to the State lab for analysis of alpha, beta and gamma (see attached analytical data in Appendix). The highest results came from site 31; gross alpha 0.88 picocuries/gram, gross beta 20.7 picocuries/gram, and Cesium 137 – 4.4 picocuries/gram. A risk assessment may be necessary to determine if these numbers could contribute a significant risk to the public.

The Watts Bar Interagency Working Group has established 15 picocuries/gram of Cs137 as their action limit (Jacobs ER Team, 1995). Based on analysis done by the State and generated from the gamma spectroscopy unit, a conservative dose of 90 millirems in addition to background would be received by a person stationed at this location for one year. The average human receives 360 millirems from all sources in a given year. The DOE and State limit for exposure to an individual member of the public from all sources,

except background, is 100 millirem/year.

A few springs were located during the survey along the shoreline. See Table 4: TDEC Field Survey Data for details and Figure 4 for locations.

The possibility that groundwater contamination will migrate from affected areas of the ORR into the study area exists and constitutes the need for groundwater use restrictions.

Positive controls will be required to ensure that inadvertent or unintentional environmental impacts are prevented. The nature of these controls should be resolved between Bechtel/Jacobs, LMER, DOE, and TDEC before the site's release or reuse to ensure that confidence in this report remains high.

In conclusion, there were minor environmental impacts to this site. The results from the TDEC investigation indicate there is low risk to public health as a result of federal activities near the study area.

9.2 SITES/FACILITIES RECOMMENDED TO BE EXCLUDED

TDEC recommends no exclusions from the Boeing study . The following maintenance actions and suggestions are recommended:

- Risk assessment numbers based on sediment sample analyses should be calculated for those areas identified as above background (gamma radiation) for future reference by the public and for land use planning.
- Continued protection and improved management is indicated for sensitive ecological sites including the rare plant species identified (e.g., Crowder Cemetery Barrens). These areas constitute a State Registered Natural Area.
- Continued groundwater use restrictions due to potential K-25 contamination of groundwater from offsite migration of radionuclides or other contaminants of concern along geologic strike in formations underlying the river channel.
- Improve stewardship of historic and pre-historic sites on the entire Boeing property including the DOE-owned floodplain areas.
- EPA should be notified to insure all CERCLA 120-h requirements are met for the transfer of property.
- Acknowledge the Lower Watts Bar ROD and the Watts Bar Interagency Working Group Restrictions on sediment disturbances.

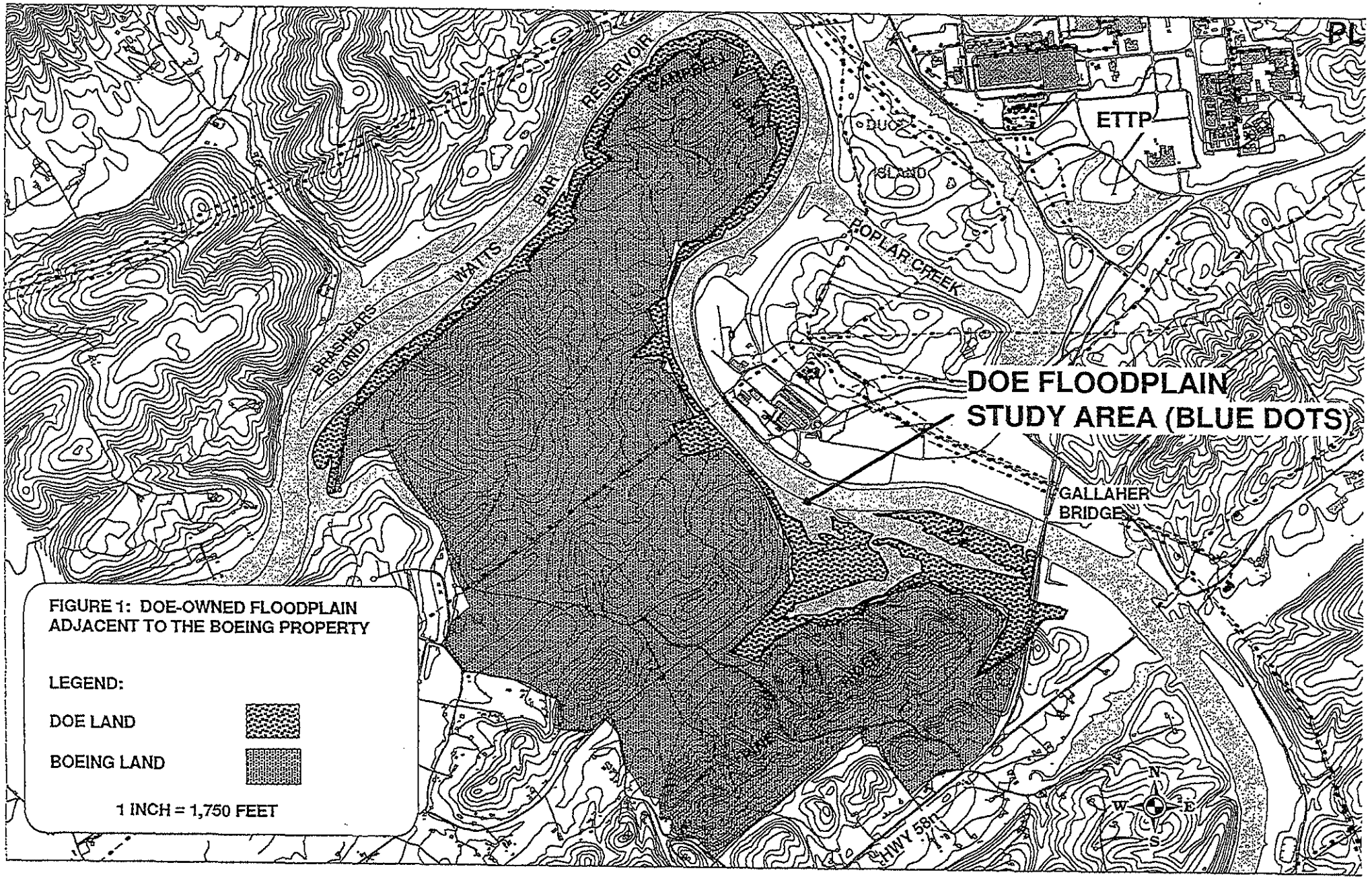


FIGURE 1: DOE-OWNED FLOODPLAIN ADJACENT TO THE BOEING PROPERTY

LEGEND:

DOE LAND

BOEING LAND

1 INCH = 1,750 FEET

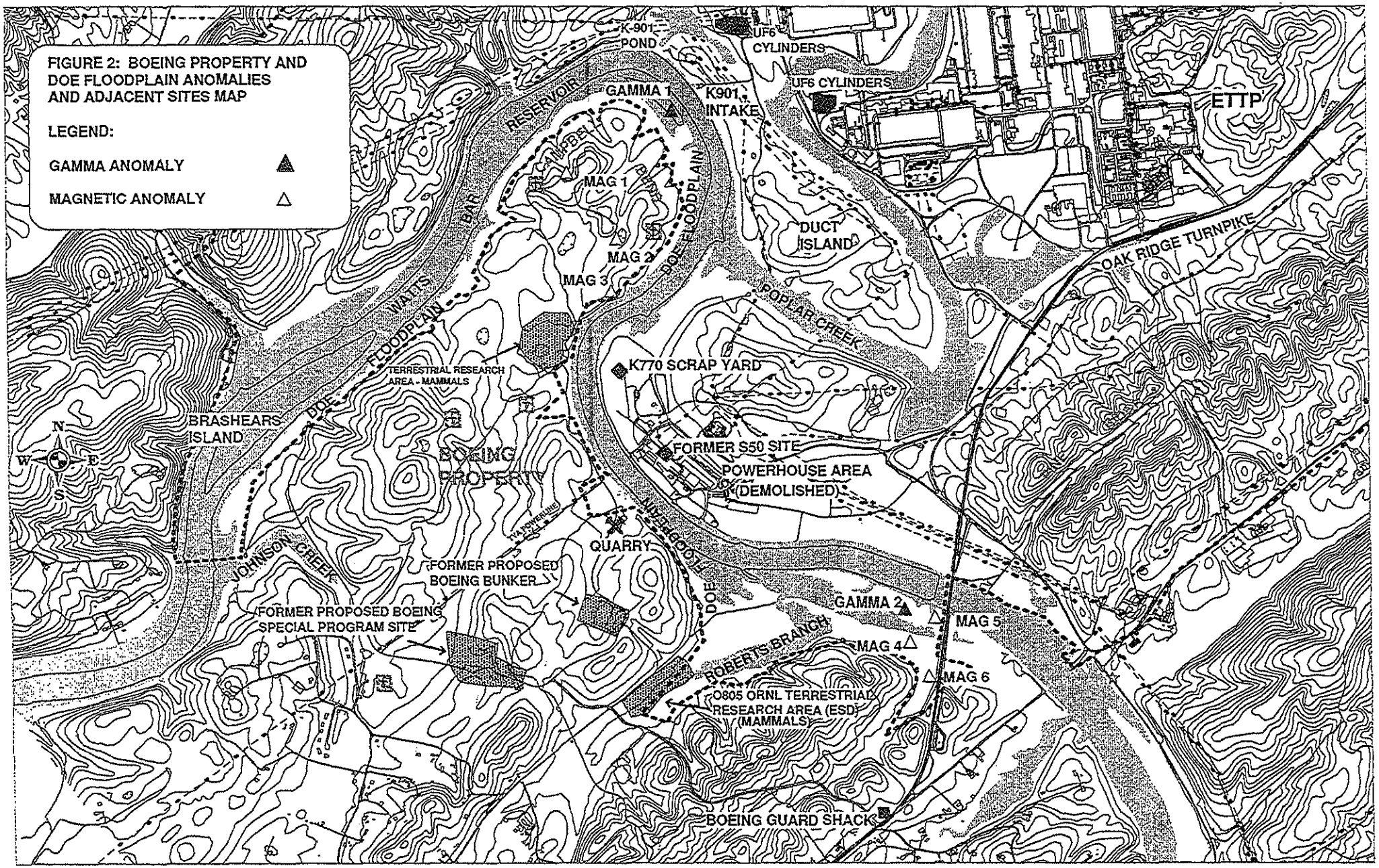
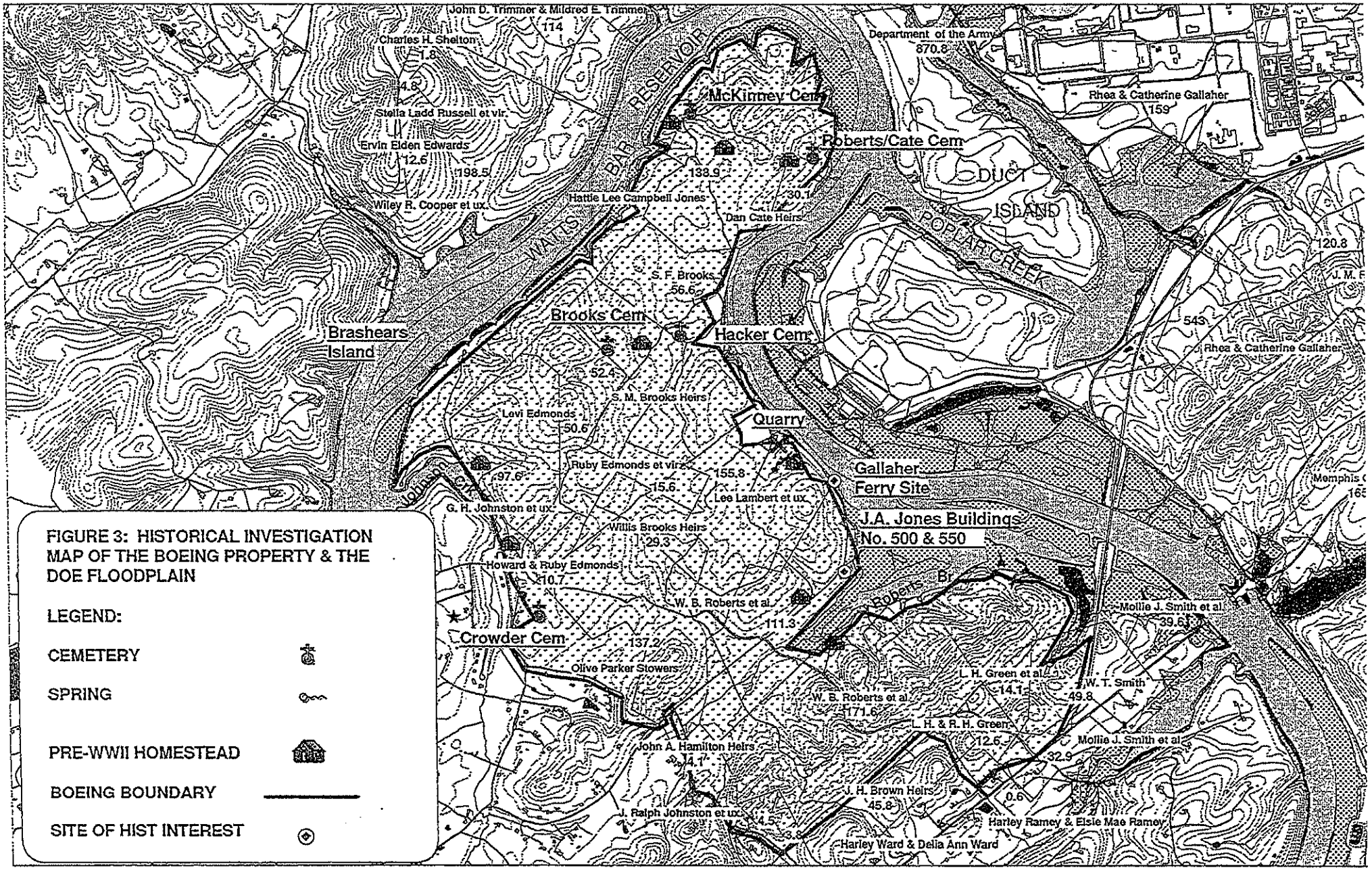


FIGURE 2: BOEING PROPERTY AND DOE FLOODPLAIN ANOMALIES AND ADJACENT SITES MAP
LEGEND:
GAMMA ANOMALY
MAGNETIC ANOMALY
K-901 POND
UF6 CYLINDERS
UF6 CYLINDERS
ETTP
GAMMA 1
K901 INTAKE
RESERVOIR
CAMPBELL BRANCH
MAG 1
DOE FLOODPLAIN
BAR
DUCT ISLAND
OAK RIDGE TURNPIKE
MAG 2
MAG 3
WATTS
FLOODPLAIN
DOE
POPLAR CREEK
TERRESTRIAL RESEARCH AREA - MAMMALS
K770 SCRAP YARD
BRASHEARS ISLAND
FORMER S50 SITE
POWERHOUSE AREA (DEMOLISHED)
BOEING PROPERTY
QUARRY
JOHNSON CREEK
FORMER PROPOSED BOEING BUNKER
FORMER PROPOSED BOEING SPECIAL PROGRAM SITE
GAMMA 2
MAG 5
MAG 4
ROBERTS BRANCH
MAG 6
0805 ORNL TERRESTRIAL RESEARCH AREA (ESD) (MAMMALS)
BOEING GUARD SHACK
N
W
E
S


John D. Trimmer & Mildred E. Trimmer
114
Charles H. Shelton
1.8
4.8
Stella Ladd Russell et vir.
Ervin Elden Edwards
12.6
198.5
Wiley R. Cooper et ux
WATTS BAR RESERVOIR
McKinney Cem
Department of the Army
870.8
Rhea & Catherine Gallaher
159
Roberts/Cate Cem
138.9
30.1
Hattie Lee Campbell Jones
Dan Cate Heirs
DUCK ISLAND
POPLAR CREEK
120.8
543
Rhea & Catherine Gallaher
S. F. Brooks
56.6
Brooks Cem
Hacker Cem
Brashears Island
52.4
S. M. Brooks Heirs
Levi Edmonds
50.6
Quarry
Ruby Edmonds et vir
155.8
97.6
15.6
Lee Lambert et ux
Gallaher Ferry Site
G. H. Johnston et ux
Willis Brooks Heirs
29.3
J.A. Jones Buildings No. 500 & 550
Howard & Ruby Edmonds
10.7
W. B. Roberts et al
111.3
Roberts Br
Mollie J. Smith et al
39.6
Crowder Cem
137.2
Olive Parker Stowers
L. H. Green et al
14.1
W. T. Smith
49.8
W. B. Roberts et al
171.6
L. H. & R. H. Green
12.6
Mollie J. Smith et al
32.9
John A. Hamilton Heirs
14.1
J. H. Brown Heirs
45.8
0.6
J. Ralph Johnston et ux
4.5
Harley Ramey & Elsie Mae Ramey
Harley Ward & Delia Ann Ward
FIGURE 3: HISTORICAL INVESTIGATION MAP OF THE BOEING PROPERTY & THE DOE FLOODPLAIN
LEGEND:
CEMETERY
SPRING
PRE-WWII HOMESTEAD
BOEING BOUNDARY
SITE OF HIST INTEREST

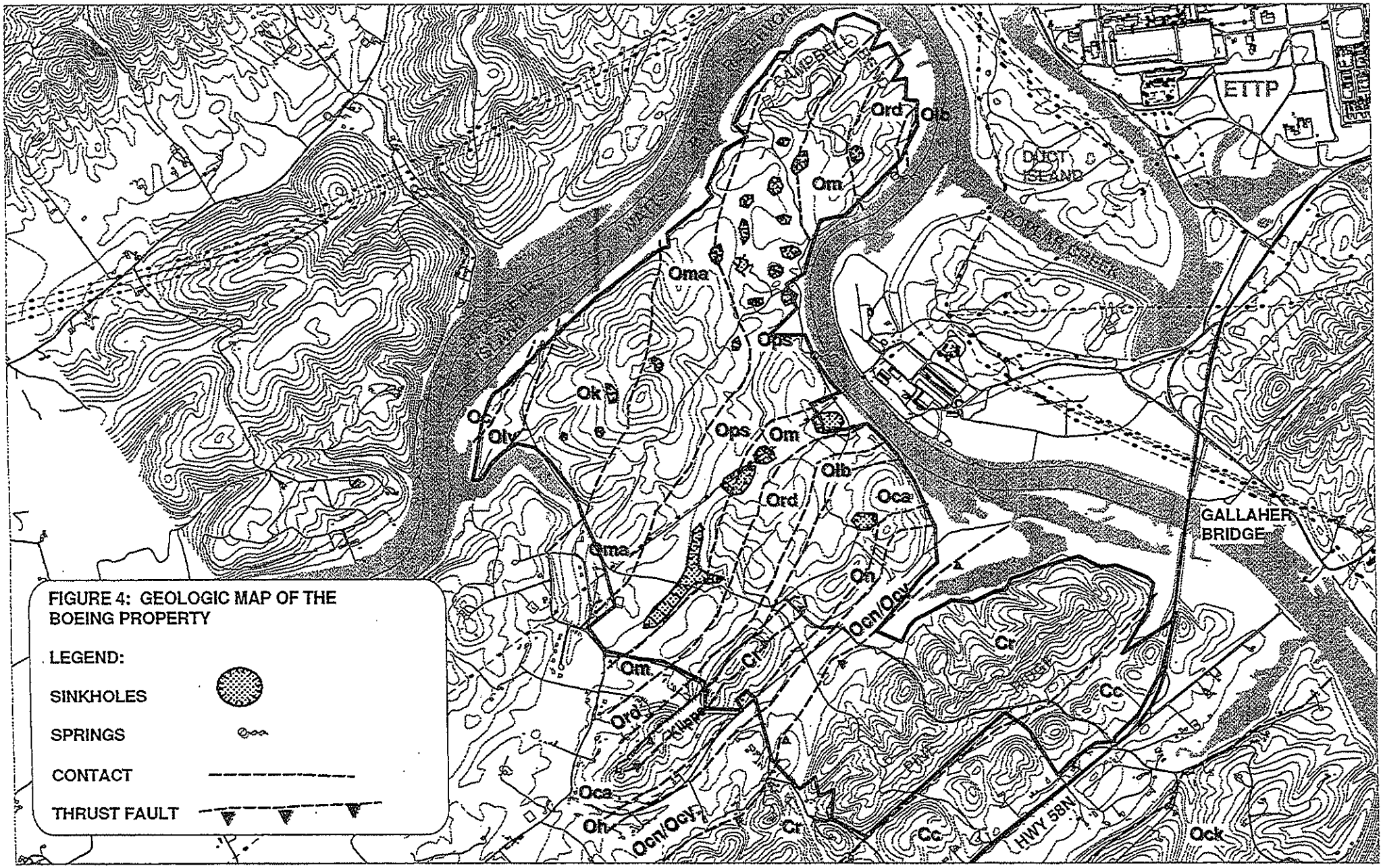


FIGURE 4: GEOLOGIC MAP OF THE BOEING PROPERTY

LEGEND:

SINKHOLES

SPRINGS

CONTACT

THRUST FAULT

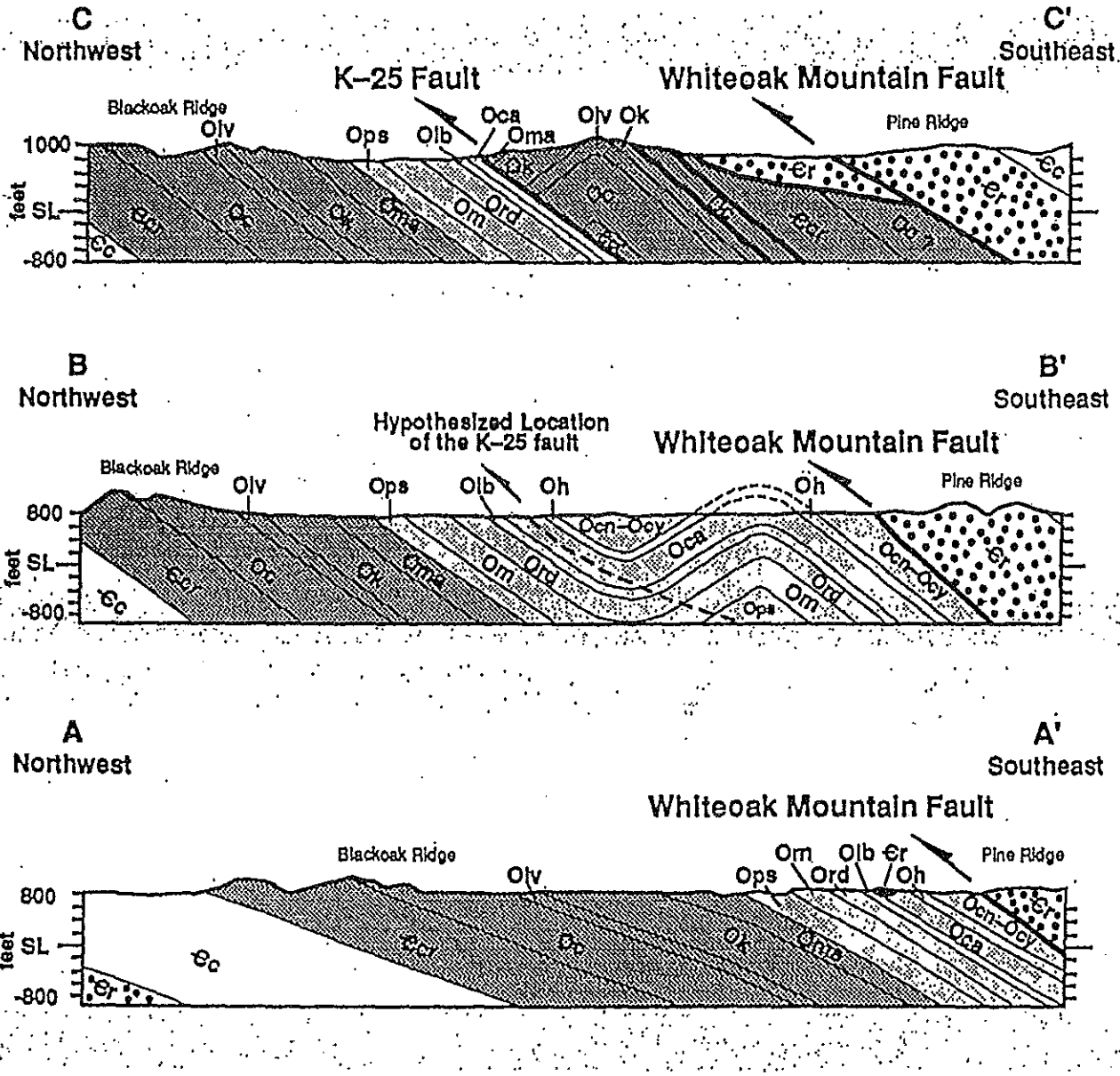


FIGURE 5: GEOLOGICAL CROSS SECTIONS ACROSS THE K-25 AND BOEING SITES
(LEMISZKI, 1994)

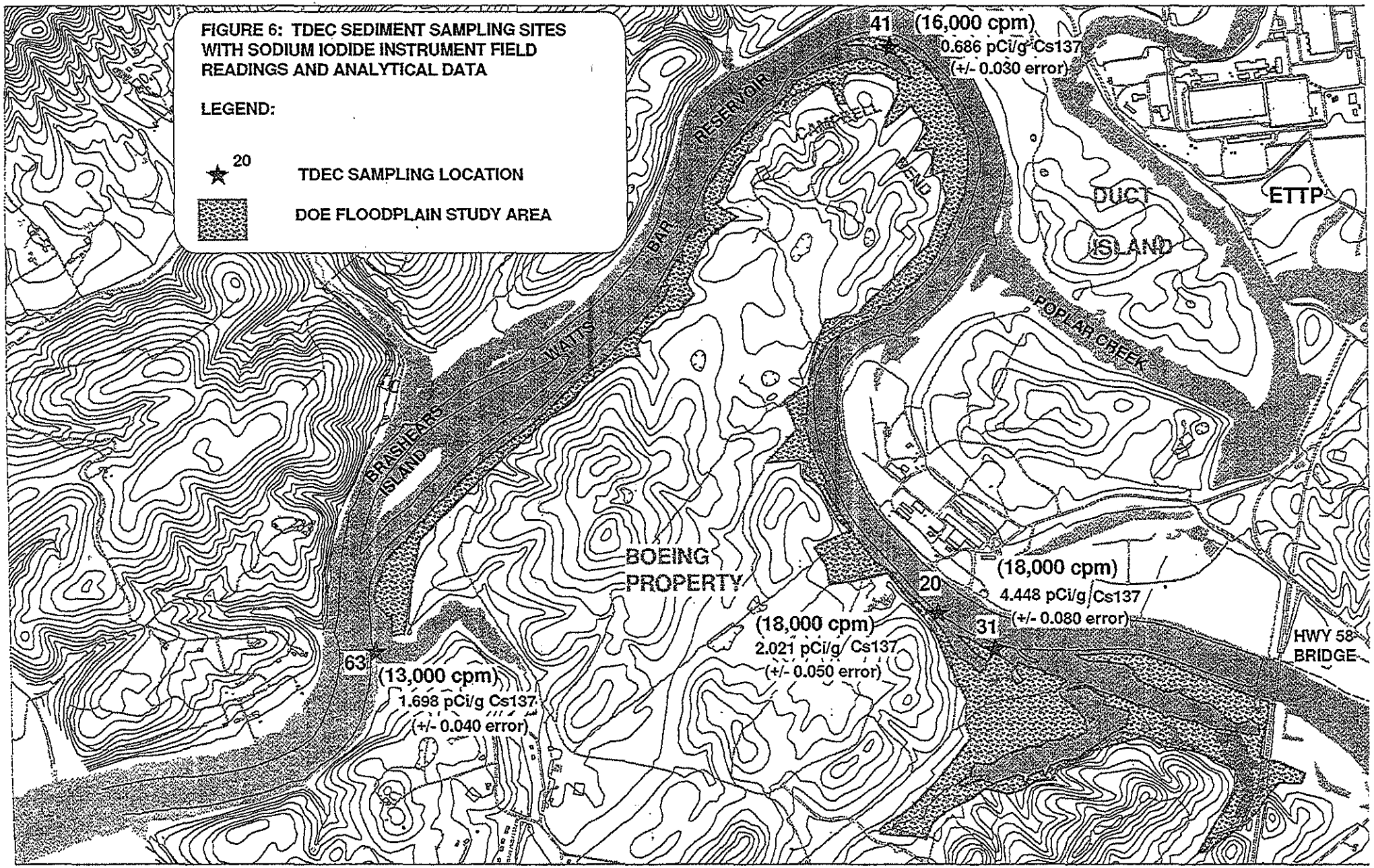


FIGURE 6: TDEC SEDIMENT SAMPLING SITES WITH SODIUM IODIDE INSTRUMENT FIELD READINGS AND ANALYTICAL DATA
LEGEND:
20
TDEC SAMPLING LOCATION
DOE FLOODPLAIN STUDY AREA
41
(16,000 cpm)
0.686 pCi/g Cs137
(+/- 0.030 error)
RESERVOIR
CAMPBELL
BEND
DUCK
ISLAND
ETTP
POPLAR CREEK
WATTS
BAR
BRASHEARS
ISLAND
BOEING
PROPERTY
(18,000 cpm)
20
4.448 pCi/g Cs137
(+/- 0.080 error)
31
HWY 58
BRIDGE
(18,000 cpm)
2.021 pCi/g Cs137
(+/- 0.050 error)
63
(13,000 cpm)
1.698 pCi/g Cs137
(+/- 0.040 error)

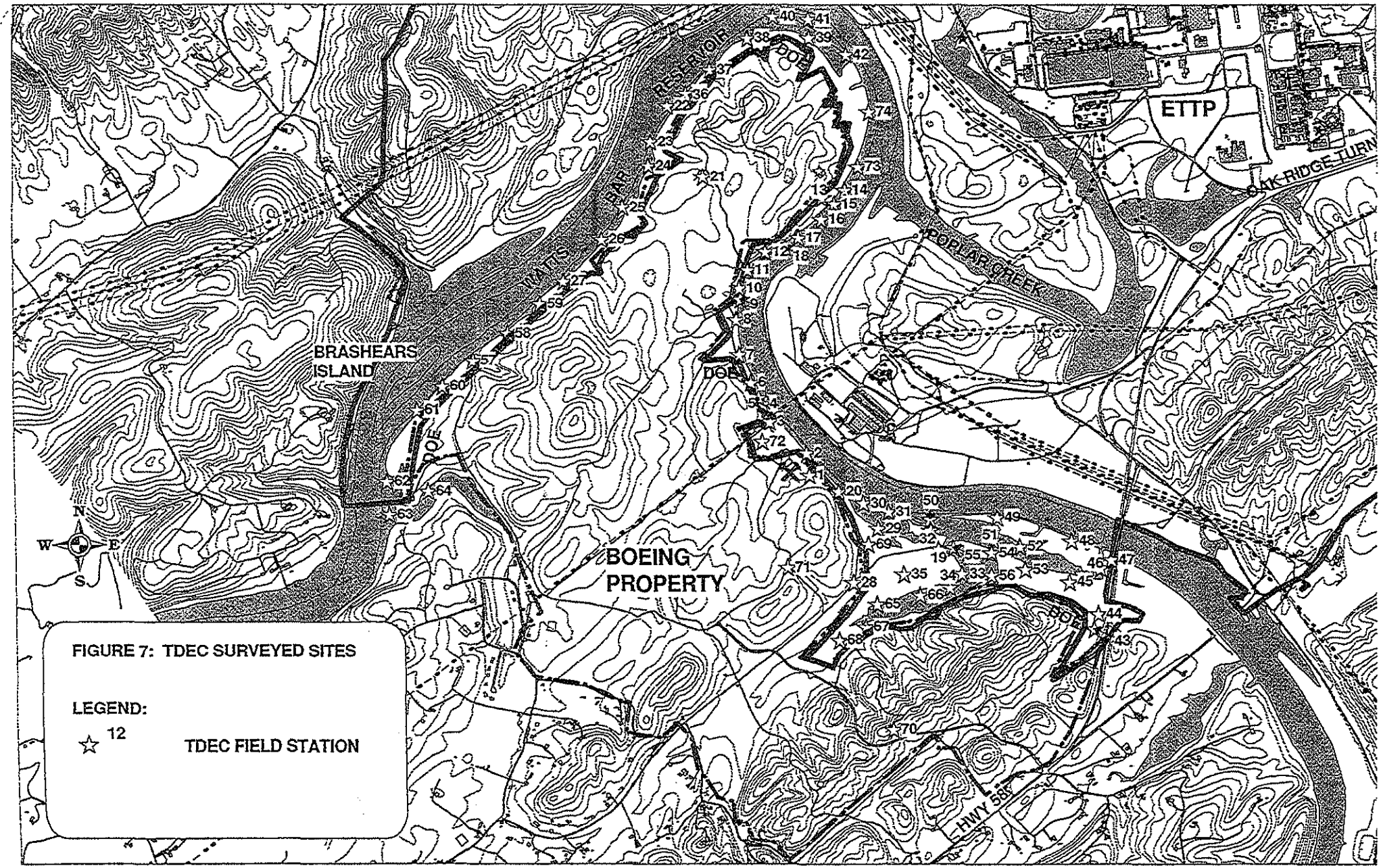


FIGURE 7: TDEC SURVEYED SITES

LEGEND:

☆ 12 TDEC FIELD STATION

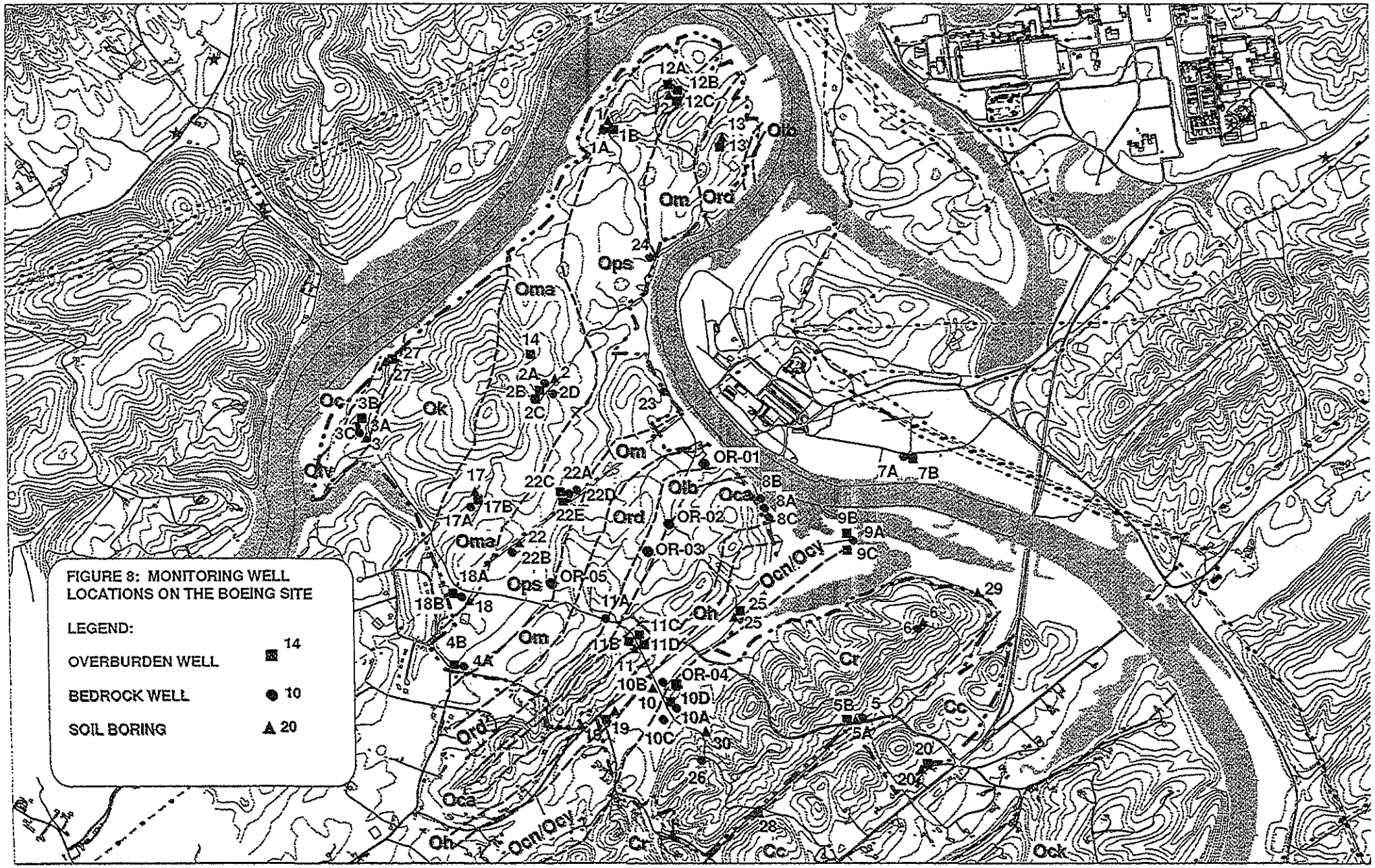


FIGURE 8: MONITORING WELL LOCATIONS ON THE BOEING SITE
LEGEND:
OVERBURDEN WELL
BEDROCK WELL
SOIL BORING
Oc
Ok
Oma
Ops
Om
Ord
Olb
Oca
Och
Ocn/Ocy
Ock
Cr
Cc
OR-01
OR-02
OR-03
OR-04
OR-05

TABLE 4:
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I.D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
1	-84.41414476	35.91337929	1/19/00	6460	6546	6682	On cedar-covered highwall overlooking abandoned quarry developed in the Ridley & Lebanon Limestone formations. Historical aerial photos indicate the quarry was in operation during the time of the existence of the S-50 thermal diffusion plant located across the Clinch River at K-25.
2	-84.41426248	35.91432921	1/19/00	9333	9406	9344	At location of small sinkhole between the quarry and the Clinch River; area covered in cedars.
3	-84.41617581	35.9156799	1/19/00	8334	8214	8168	TVA powerline right-of-way near the Clinch River along gravel access road.
4	-84.41651352	35.91641998	1/19/00	8851	8670	8631	Clinch River shoreline across from the former S-50 site (K-25 Plant). Watts Bar Lake level is down to winter pool elevation leaving approximately 15 feet(from high pool shoreline to waters' edge) of sandy beach.
5	-84.41669726	35.9166856	1/19/00	13084	13085	13149	River bank at small topographic indention along shoreline.
6	-84.41711237	35.91734122	1/19/00	7807	7737	7723	River bank at small topographic indention along the shoreline exposed by low Watts Bar Lake stage. Bluehole spring emerges from from a 10 foot wide depression on the beach.
7	-84.41771251	35.91854396	1/19/00	9907	10029	9936	Topographic indention along the shoreline.
8	-84.41780648	35.92003642	1/19/00	7527	7554	7267	Rocky shoreline (Pond Spring Formation).
9	-84.41757562	35.92089778	1/19/00	4574	4695	4422	Pond Spring Formation carbonates exposed along shoreline at this location.
10	-84.41761382	35.92137747	1/19/00	7065	7162	7114	On small cedar-covered bluff overlooking the Clinch River; yucca plants in the vicinity suggest a former house site.

TABLE
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
11	-84.41714813	35.92214706	1/19/00	6268	6532	6229	Limestone outcrop area in a small drainage along 5-foot high river banks; vicinity covered with cedars.
12	-84.41618019	35.92289578	1/19/00	5382	5510	5344	Rocky area with numerous limestone outcrops(Murfreesboro Limestone) in a mature v-shaped drainage covered in cedars.
13	-84.41311482	35.9251588	1/21/00	9647	9495	9519	At the location of a pre-Manhattan home site and Roberts cemetery(appears to hold 2-3 graves) on hill side overlooking the Clinch River to the east. the area consists of stone walls, foundation stone, rusted stove, cistern, old bedsprings, broken glass jars, etc. Vicinity covered in cedars and briers with adjacent reforestation area(numerous dead and fallen pines) toward the river. **Magnetic anomaly #2** located west of this location may be due to a sinkhole.
14	-84.41192952	35.92546169	1/21/00	7915	7899	7785	On Campbell Bend shoreline opposite the mouth of Poplar Creek at its' junction with the Clinch River.
15	-84.41247542	35.92489329	1/21/00	8670	8473	8664	Along Campbell Bend shoreline at location of a small seep.
16	-84.4131718	35.9242549	1/21/00	9253	9048	9181	Further south along shoreline in rocky area(Murfreesboro Limestone).
17	-84.41440244	35.92350291	1/21/00	7743	8012	7965	On Murfreesboro Limestone outcrop along the river embankment. Comprising the limestone at this location were numerous brachiopod and sponge fossils.

TABLE
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
18	-84.4151158	35.92307604	1/21/00	6731	6760	6741	On rocky bluff overlooking the Clinch River and the steam plant area of K-25 Plant.
19	-84.40745166	35.91008778	1/21/00	6768	7008	6599	Old gravel road bed dead-ends at lake inlet embankment; remains of old wooden bridge evident(old road continues on embankment on opposite side). Three plugged & abandoned wells(9A/9B/9C - see Figure 8) are located here.
20	-84.41264925	35.91264651	1/21/00	18361	18198	18420	Clinch River shoreline opposite the K25 steam plant site. Rotted wooden remains of the old Gallaher ferry dock/ramp located here. Sediment sample **"BOE-1"** collected here. Gamma spec instrument onsite analysis of this location indicates the presence of Cs-137 radionuclide. Gamma radionuclide analysis of the sediment sample confirmed these findings by yielding results of 2.021 pCi/g (+/- 0.050 error factor) Cs-137.
21	-84.41940435	35.92612169	1/25/00	8448	8503	8563	Junction of gravel roads, south of the location of McKinney cemetery, in an open, grassy barrens-type(cleared) area. **Magnetic anomaly #1** located northeast of this location may be due to debris associated with a pre-Manhattan home site.
22	-84.42118126	35.92919467	1/25/00	7443	7835	7790	Shoreline area along Campbell Bend just north of the McKinney cemetery(part of the former McKinney Plantation site). The vicinity inland(oldfield) had been reforested in pines years ago and have since succumbed to the pine beetle infestation. Fallen trees have created a tangled log-jam in the understory.
23	-84.4221287	35.92767465	1/25/00	8713	9137	9190	Shoreline downriver of previous point; sandy beaches.

TABL_ .:
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
24	-84.42227577	35.92664423	1/25/00	13883	14070	14051	Small inlet drainage and backwater area; Watts Bar Lake stage was low this date enabling good coverage of the mudflat sediments in this area. This site corresponds to one of the EG&G(Burson, 1976) flyover gamma detect areas shown on Map C-1 in Appendix C(radiation levels resulting from only man-made radioisotopes inferred from helicopter survey data). Cs-137 is the suspected radionuclide.
25	-84.42368615	35.92490171	1/25/00	7026	7110	6970	Shoreline downriver of previous point; sandy beaches.
26	-84.42483375	35.92355014	1/25/00	7256	7177	7285	Rocky shoreline downriver of previous point.
27	-84.42689958	35.92179762	1/25/00	6936	6900	7072	Rocky shoreline downriver of previous point.
28	-84.41197232	35.90877168	1/27/00	8329	8146	8356	Junction of gravel/dirt roads located north of Roberts Branch and east of large clearing. Pine reforestation area. Historical aerial photos indicate the presence of a pre-Manhattan homesite/barn.
29	-84.41061354	35.91102037	1/27/00	12073	12153	12195	Near emergence of a large backwater(sand bar) area exposed due to low Watts Bar Lake stage. Consistency of the shoreline sediments at this location is a sticky muck(clayey).
30	-84.41135951	35.91211135	1/27/00	10123	10230	10164	Exposed beach area due to low Watts Bar Lake stage. Located across the Clinch River from the old K25 steam plant area.

TAB :
TDEC FIELD SURVEY DATA
BOEING PROPERTY

Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
31	-84.41005346	35.91173879	1/27/00	18308	17881	18007	Large mudflat area exposed due to low Watts Bar Lake stage. An old 5-inch iron sewer pipe was observed protruding from the river bank(pre-Manhattan housesite?). No other evidence of habitation or artifacts could be found. This station is in one of the EG&G gamma flyover detect areas(1976, Burson report - helicopter aerial survey) shown on Map C-1 where TDEC collected sediment sample "BOE-2". Gamma spec instrument onsite analysis indicated the presence of the radionuclide Cs-137. Sediment sample analysis confirmed this finding with 4.448 pCi/g (+/- 0.080 error) of Cs-137.
32	-84.40787095	35.91091197	1/27/00	9489	9764	9383	On exposed sand bar beach adjacent to an osprey nest stand on a small island.
33	-84.40625565	35.90905691	1/27/00	10909	11085	11140	Along Roberts Branch cove inlet (northern exposed shoreline).
34	-84.40691645	35.9084842	1/27/00	12435	12589	12623	Further west along Roberts Branch inlet shoreline; numerous killdeer birds observed.
35	-84.40931668	35.90907549	1/27/00	11945	11711	11872	Inland from previous point on fairly level pine-reforested(healthy stand of mature pines) peninsula.
36	-84.42018786	35.92972001	1/28/00	7292	7179	7156	Along Campbell Bend shoreline north of McKinney cemetery. Old bricks were strewn about the beach at this location. Forays inland failed to produce further evidence of pre-Manhattan habitation. The general area was log-jammed with dead and fallen pines.
37	-84.41887399	35.9306938	1/28/00	9666	9905	9767	Near location of small inlet along Campbell Bend shoreline. Low Watts Bar Lake stage conditions has exposed a +60-foot wide beach in this vicnity.

TABL .:
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
38	-84.41682949	35.93200309	1/28/00	14975	14739	15155	Wide sand bar beach area at location of a small inlet approaching the "bend " of the river. This site is very near one of the EG&G flyover(Burson, 1976: helicopter survey report) gamma detection areas along the exposed mudflats of Campbell Bend (see Map C-1 in Appendix C). The NaI(Ludlum sodium iodide) instrument readings recorded here by TDEC field personnel reflect the suspect Cs-137 contaminated sediments. NaI readings increased to 22,000 cpm at several nearby "spotty" locations along the exposed sand bar.
39	-84.41356321	35.93198036	1/28/00	10906	11103	10701	At the location of a pre-Manhattan fenceline/treeline in a backwater mudflat exposed by low lake stage conditions.
40	-84.41548552	35.93290277	1/28/00	15804	16101	15941	At point of spit(leads into large backwater area) on sand bar beach exposed by low Watts Bar Lake stage. Map C-1 of Appendix C shows the location of a large detection area of gamma around Campbell Bend(Burson, 1976 -EG&G helicopter flyover report). Again, Cs-137 is the suspected radionuclide. TDEC detected gamma readings near this station up to 17,000-18,000 cpm with the NaI instrument(Ludlum sodium iodide).
41	-84.41361175	35.9327771	1/28/00	15696	16772	16791	Shoreline beach exposed by low Watts Bar Lake stage along main Clinch River channel at the apex of Campbell Bend. TDEC collected sediment sample "BOE-3" at this location. The gamma spec instrument onsite analysis indicated the presence of the radionuclide Cs-137. The sediment sample analysis confirmed this finding with results of 0.686 pCi/g (+/- 0.030 error) of Cs-137.

TAB :

TDEC FIELD SURVEY DATA

BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
42	-84.41163508	35.93124498	1/28/00	7675	7600	7675	Beach area further upriver of previous TDEC field point. Across from the K-25 "901 area" intake station. This field point is in the close vicinity of **Gamma anomaly #1**. No readings above background recorded in this area utilizing the NaI (Ludlum sodium iodide) instrument.
43	-84.39944609	35.90665043	1/31/00	11658	11800	11735	Along exposed mudflats(marshy) of unnamed drainage inlet adjacent to Highway 58. **Magnetic anomaly #6** located near this location is probably due to the guardrail and scrap metal on the steep shoulder embankment along Highway 58.
44	-84.39920246	35.90728693	1/31/00	12674	12713	12764	Inlet area shoreline mudflats at the location of a large concrete culvert at the toe of the fill of Highway 58(steep embankment); wetlands area.
45	-84.40065612	35.90863759	1/31/00	10852	11001	9916	Along old roadbed constructed on a spit between two backwater areas at the location of two large metal culverts. It appears from historical aerial photos that this abandoned and overgrown road(trends northwest to southeast and terminates at the new Highway 58 bridge area) was formerly associated with and provided access to the Gallaher Ferry site.

TAB
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
46	-84.3990344	35.90918693	1/31/00	18618	18351	18274	Wetlands, sand bar & marshy strip of land somewhat exposed by low Watts Bar Lake stage conditions; scattered young trees and numerous cattails. NaI gamma instrument readings as high as 22,000 cpm were recorded in the general vicinity. This site is the location of both Gamma anomaly 2(GIST, 2000 - anomaly maps) and also area of interest - AOI-6(BJC LLC, 1998 report containing historical aerial flyover radiological data for 1992, 1993 and 1997). The suspect radionuclide is once again Cs-137, deposited amongst riverine sediments from an upriver source.
47	-84.39846804	35.90951693	1/31/00	6534	6537	6652	Clinch River shoreline just below the Gallaher bridge(Highway 58) amongst riprap stones. Magnetic anomaly #5 is associated with the Gallaher Bridge and/or metallic guardrails.

TAI 4:
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
48	-84.40049142	35.91035362	1/31/00	7855	7864	7700	Further downstream of previous TDEC point along main river channel; sandy beaches exposed by low Watts Bar Lake stage.
49	-84.40437466	35.91142276	1/31/00	6595	6553	6379	Along shoreline at the location of a large pile of riprap stones, including concrete(with steel rebar) and asphalt rubble.
50	-84.40788454	35.91137818	1/31/00	17288	17227	17350	On sand bar exposed by low Watts Bar Lake stage at the confluence of Roberts Branch (embayment) with the main river channel. Osprey nest on pole on exposed beach area that forms a small island at full pool stage. This location is just a few hundred feet upriver of TDEC sample point "BOE-2". The suspect radionuclide is Cs-137 deposited amongst riverine sediments from an upriver source.
51	-84.40457711	35.91044347	1/31/00	11694	11774	11912	In a large backwater mudflat area exposed by low Watts Bar Lake stage.
52	-84.40320001	35.91015755	1/31/00	12223	12269	12434	Backwater embayment area(exposed by low Watts Bar Lake stage) at the shoreline bank adjacent to a spit (wooded land between the main channel and the backwater area).
53	-84.40295116	35.90919331	1/31/00	9758	10061	9940	Wetlands area on old, abandoned road bed which may have been associated with access to the old Gallaher Ferry site.
54	-84.40469002	35.90990765	1/31/00	8223	8175	8174	Backwater embayment area(exposed by low Watts Bar Lake stage) at its' high pool bank across the embayment from TDEC point 52. This general area forms a cove and is part of the wetlands area.
55	-84.40667263	35.91013686	1/31/00	10254	10425	10325	Along shoreline of cove inlet (exposed by low Watts Bar Lake stage) along the original creek channel of Roberts Branch.

TAB
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
56	-84.40472183	35.9089676	1/31/00	11879	12133	12202	Cove inlet shoreline along original creek channel of Roberts Branch(exposed by low Watts Bar Lake stage).
57	-84.43175712	35.9184926	2/1/00	8181	8167	8238	Shoreline along main river channel across from confluence of Brashears Creek.
58	-84.42989912	35.91961623	2/1/00	8193	7963	8084	Shoreline upriver of previous TDEC point.
59	-84.4281603	35.92085143	2/1/00	7498	7571	7428	Shoreline upriver of previous TDEC point.
60	-84.43336605	35.91738079	2/1/00	8367	8235	7705	Shoreline opposite Brashears Island; K25 employees have reported observing *Haliaeetus leucocephalus* (Bald eagle) in this area
61	-84.43473038	35.91639618	2/1/00	5980	5777	5980	Downriver of previous point; beaver lodge constructed on shoreline nearby.
62	-84.43642975	35.91337512	2/1/00	6221	6320	6163	Large sand bar area exposed due to low Watts Bar Lake stage(along main channel shoreline) near mouth of Johnson Creek embayment.
63	-84.43634495	35.91194769	2/1/00	14803	14770	14602	Sand bar expoed by low lake pool elevation adjacent to Johnson Creek at its' confluence with the main channel of the Clinch River. TDEC sediment sample "BOE-4" collected at this location. The counts increased to 15,700 cpm with depth(into a few inches of sediment). The gamma spec instrument onsite analysis indicated the presence of the radionuclide Cs-137. Analytical data received confirmed this finding with 1.698 pCi/g (+/- 0.040 error) of the radionuclide Cs-137.

TABLE 4:
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No.	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
64	-84.43429567	35.9129259	2/1/00	7651	7845	7946	Upstream along Johnson Creek in mudflat area exposed due to low Watts Bar Lake stage. Upstream of this location there was a pre-Manhattan reservoir, water wheel and pump station for use on the former Thomas Johnston tract.
65	-84.41075321	35.9078468	2/2/00	11677	11843	11844	Exposed shoreline due to low Watts Bar Lake stage along Roberts Branch embayment.
66	-84.40848968	35.90819343	2/2/00	12620	12908	12819	Exposed shoreline due to low Watts Bar Lake stage along Roberts Branch embayment; recent beaver activity noted(freshly gnawed bark off the base of trees).
67	-84.4113838	35.90690148	2/2/00	10176	10257	10410	Beside Roberts Branch at location of beaver dam and small pond in a deciduous wooded area. Historical aerial photos indicate the presence of a small orchard, several barns, cribs and small houses located north & south of Roberts Branch near this position.
68	-84.41281369	35.90635851	2/2/00	10933	10946	10998	Beside Roberts Branch west of previous point in a deciduous wooded area. Just northwest of this point was the location of ORNL's 0805 Terrestrial Research Area (ESD - 1965).
69	-84.41113627	35.91034991	2/2/00	10881	10865	10838	Location of demolished J.A. Jones buildings(building #500 and # 550 - personnel & pass) at junction of roads near the Gallaher Ferry site. Historical aerial photos indicate several large barracks-type buildings. Only evidence found was a cellar or basement with approximate dimensions of 10 x 15 feet, some scrap metal including a piece of a stove and a short piece of rusted drain pipe in the cellar, an old tire, dirt mounds and numerous tall privet shrubs. The entire area has been reforested with pines.

TAE k:
TDEC FIELD SURVEY DATA
BOEING PROPERTY

TDEC Field Site I. D. No:	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	Date	cpm1	cpm2	cpm3	Site Description
70	-84.41007327	35.90246577	2/9/00	14076	14284	14016	Hilltop cut along paved access road; ridge line is underlain by the Rome Formation(high Nal readings are due ot the natural uranium-bearing shales in this area).
71	-84.41542116	35.90943864	2/9/00	10060	10383	10338	Large grassy clearing at junction of dirt roads. This rectangular-shaped barren area was to be the site of one of Boeing's missile manufacturing facilities("Common Bunker Site").
72	-84.41659374	35.91483602	2/9/00	11298	11424	11416	In a cedar glade west of the Clinch River near the TVA powerline right-of-way.
73	-84.41120595	35.92645544	2/9/00	9035	9349	9121	Shoreline area of Campbell Bend opposite the mouth of Poplar Creek's confluence with the Clinch River. Inland the area is covered with a tangle of dead and fallen pines and briers.
74	-84.41053883	35.92880057	2/9/00	7295	7498	7295	Shoreline sand bar exposed by low lake stage conditions. Located further downriver of previous TDEC point.

TABL :

ANOMALY RESOLUTIONS

BOEING PROPERTY/DOE FLOODPLAIN PROJECT

Anomaly I.D. #	Anomaly Association (Description or Reason for Anomaly))
Gamma 1	Sandbar area along Campbell Bend where Cs-137 contaminated sediments have accumulated from an upriver source.
Gamma 2	Backwater marsh area adjacent to the Gallaher Bridge(Hwy 58N) where Cs-137 contaminated sediments have accumulated from an upriver source.
Magnetic 1	Plugged and abandoned well cluster located 600 feet east of the McKinney Cemetery.
Magnetic 2	Sinkhole located 500 feet northwest of the Cate/Roberts Cemetery.
Magnetic 3	Rocky bluff and probable river navigation daymark located in this vicinity.
Magnetic 4	Large metal culverts(2) underlying an old and overgrown road providing drainage between two backwater areas.
Magnetic 5	Associated with Highway 58N bridge guardrails and/or the Gallaher Bridge structure.
Magnetic 6	Large metal and concrete culvert at the toe of the Highway 58N fill adjacent to a large marshy inlet.

Historical Investigations and Publishing Services

Comprehensive Environmental Response, Compensation and Liability Act Section 120(h) Assessment for the Department of Energy Floodplain Strip Adjacent to Boeing Property, Oak Ridge, Tennessee

A. Milton Stanley
David T. Kendall

March 2000

424 Normandy Road, Oak Ridge, Tennessee 37830-8121 — 865 481-3708 — http://www.usit.net/hips

EXECUTIVE SUMMARY

A variety of federal, state, and county resources were reviewed to determine whether or not available information indicates hazardous substances were stored, disposed of, or released onto the DOE Floodplain Strip Adjacent to Boeing Property in Oak Ridge, Tennessee. Information sources used in this search include interviews, reports, maps, deeds, aerial photography, and remote sensing data from the 1940s through the 1990s. Additional site visits and continuous radiological monitoring of the shoreline were conducted by the DOE Oversight Office of the Tennessee Department of Environment and Conservation (TDEC), and laboratory evaluations were performed for soil and sediment where elevated levels of radioactivity were found.

Records were also reviewed to determine whether or not adjacent or nearby properties may have contributed to environmental contamination at the DOE Floodplain Strip. These adjacent or nearby properties include the Boeing property, Clinch River/Poplar Creek Operable Unit, East Tennessee Technology Park, Clinch River Consolidated Industrial Park, and the former S-50 Liquid Thermal Diffusion Plant. Limited site visits were also performed at the Boeing property by TDEC.

None of these investigative efforts indicated that hazardous substances have been stored, released, or disposed of on the DOE Floodplain Strip.

Continuous monitoring of shoreline sediments by TDEC resulted in the discovery of four areas with radiological readings substantially above background. Subsequent laboratory isotopic analyses revealed radionuclides consistent with releases from ORNL via White Oak Lake.

Clinch River and Poplar Creek sediment contamination from ORNL and other Oak Ridge Reservation sources has been addressed previously in a CERCLA Record of Decision (ROD). Under the Clinch River/Poplar Creek ROD, institutional controls are being implemented to protect human health. These controls include fish consumption advisories, regulatory and institutional controls to prevent disturbance of contaminated sediments, and a monitoring program to detect changes in contaminant concentrations in fish and confirm the effectiveness of fish-consumption advisories. Regulatory and institutional controls fall under the purview of five state and federal agencies: EPA, TDEC, COE, TVA, and DOE. These five agencies have formed a working group for Watts Bar Reservoir permit coordination regarding construction and other activities likely to disturb sediment on Clinch River or Poplar Creek.

As a result of visual and radiological characterization of the DOE Floodplain Strip, TDEC has concluded that the risk to public health is low from federal activities near the study area. Additional historical investigation carried out for this report indicates no risks from other, non-federal sources.

2. TITLE SEARCH

A complete search of available Department of Energy records, documentation, and data within the DOE-ORO real estate files was made regarding the property known as the DOE Floodplain Strip Adjacent to Boeing Property in Oak Ridge, Tennessee. Records reviewed in that search do not indicate that hazardous substance activity as defined by Section 101(14) of CERCLA took place on the DOE Floodplain Strip. A letter documenting the results of this search is included as Appendix A of this report.

On March 3, 2000, a visit was made to the Roane County Register of Deed's Office in Kingston, Tennessee, and an additional review was made of recorded deeds documenting previous ownership of the land now known as the DOE Floodplain Strip. The deeds contained no information or references to other recorded evidence that, prior to ownership by the U. S. Tennessee Valley Authority (TVA) or DOE and predecessor organizations, the property was used for storage of hazardous substances and/or petroleum products or their derivatives. Additionally, no information contained in the deeds would indicate that hazardous substances and/or petroleum products or their derivatives were released from or disposed of on the property.

3. FEDERAL RECORDS SEARCH

During the course of previous CERCLA 120(h) and related investigations, the Tennessee Valley Authority (TVA) in Knoxville, Tennessee, and the U. S. Army Corps of Engineers (COE) district office in Nashville, Tennessee, were contacted regarding the availability of relevant records on past or present land usage on the Oak Ridge Reservation (ORR). Neither TVA nor the COE had information regarding land usage that would indicate hazardous substances or petroleum products had been stored or released in this area of the ORR (BJC 1999; Newman 2000). For this report, confirmatory calls were made to TVA and COE to verify this information and ensure no new information had been discovered (COE 2000; TVA 2000).

For preparation of this report, a thorough search was conducted of DOE-ORO real estate records, data, and documentation for evidence on whether or not hazardous substance activity as defined in Section 101(14) of CERCLA had taken place on the DOE Floodplain Strip Adjacent to Boeing Property. A letter from the DOE-ORO realty officer indicating that no such evidence was found is included as Appendix A of this report.

Further search was made of an extensive collection of drawings, maps, reports, building directories, and aerial photographs from a variety of DOE-ORO records locations: ORNL Laboratory Records, ORNL Reservation Services files, ETTP Active Records Center, ETTP Inactive Records Center, the former K-25 Site Photography Department, and DOE-ORO Photographic Services. These resources were identified during an earlier effort, the DOE-ORO Footprint Reduction Program, for characterizing hazardous waste activities over the entire ORR. Because much of this source information had been previously identified, an unusually broad amount of material was available for expeditiously evaluating uses of the DOE Floodplain Strip and adjacent properties. In addition, interviews were conducted of key DOE-ORO contractor and subcontractor personnel with knowledge of hazardous waste and other operations on the ORR. A complete listing of DOE-ORO records reviewed, along with other federal, state and private sources used in preparing this report, is included here as Appendix B.

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

February 25, 2000

Milton Stanley
124 Normandy Road
Oak Ridge, Tennessee 37830

Dear Mr. Stanley:

STATEMENT OF CERCLA RESEARCH, DOE FLOODPLAIN STRIP ADJACENT TO BOEING PROPERTY, OAK RIDGE, TN

I refer to our telephone conversation on February 24, 2000 in which we discussed the pending CERCLA investigation report you will be accomplishing for Charles Hicks of the Oak Ridge Land Company, LLC.

Enclosed is a statement indicating that the Department of Energy (DOE) real estate records have been researched. The review did not reveal any data indicating there was hazardous substance activity on the floodplain strip of property adjacent to Boeing's property in Roane County, Tennessee. This statement should be made a part of your report.

Please feel free to call me at 576-0977 for any questions you may have.

Sincerely,

Katy Kates

Katy Kates
Realty Officer

Enclosure
As stated

cc: Charles Hicks, Oak Ridge Land Company, LLC
R.O. Hutchison, The Stonehenge Companies
Pat Halsey, DOE EM-92

CONVEYANCE OF FLOODPLAIN STRIP ADJACENT TO FORMER BOEING PARCEL IN ROANE COUNTY, TN

FILES RESEARCH FOR HAZARDOUS SUBSTANCE ACTIVITY

The following statement is provided in support of guidance promulgated under Section 120(h) of the Comprehensive Environmental Response, Liability, and Compensation Act, as amended (CERCLA) 42 U.S.C. 9620(h) and in support of regulations issued by the Environmental Protection Agency at 40 CFR part 373.

The undersigned has made a complete search of existing and available Department of Energy (DOE) records, documentation, and data within the real estate files relating to the property that is subject to the proposed conveyance of approximately 182.00 acres of fee land from DOE to Oak Ridge Land Company, LLC. The search conducted was considered reasonable with a good faith effort expended to identify whether any hazardous substances were stored for one year or more, released, or disposed of on the property. The available records do not reflect by any determinable reference that hazardous substance activity as defined by Section 101(14) of CERCLA took place on the property designated as the floodplain area during the time the property was owned by the United States of America.

Katy Kates

Katy Kates
Realty Officer
February 28, 2000

Determination of Suitability for Release Under CERCLA Section 120(h)(4) for DOE Floodplain Strip Adjacent to the Boeing Property (formerly DOE-ORR Segment O)

December 2000

U.S. Department of Energy
Oak Ridge Operations Office
Oak Ridge, Tennessee

Determination of Suitability for Release Under CERCLA Section 120(h)(4) for DOE Floodplain Strip Adjacent to the Boeing Property (formerly DOE-ORR Segment O)

EXECUTIVE SUMMARY

This document describes the basis for a determination by the U.S. Department of Energy (DOE) that a parcel of real property is suitable for release as uncontaminated property under Section 120(h)(4) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The subject parcel consists of approximately 182 acres along the bank of the Clinch River near the western boundary of the DOE Oak Ridge Reservation (ORR). This property comprises the 500-year floodplain (750 ft elevation contour) of the Clinch River, and surrounds another parcel previously released by DOE to the City of Oak Ridge, and originally designated DOE-ORR Segment O and now generally referred to as the Boeing Property. A commercial real estate developer has proposed the purchase of these combined parcels for a mixed use development which would include residential, commercial, and industrial land use.

Much of the information pertaining to the determination of the suitability of the subject parcel for release under CERCLA Section 120(h)(4) has been published in a previous document commissioned by the developer (Stanley and Kendall, 2000). This assessment included the evaluation of historical records, aerial photographs, interviews, and remote sensing data from the 1940's through the 1990's. In addition to this assessment, the Tennessee Department of Environment and Conservation (TDEC) conducted a radiological survey and sediment sampling program for the shoreline area during January and February 2000 and DOE conducted a groundwater sampling program during October 2000. Results of these investigations are described in this document. None of these investigative efforts have indicated that hazardous substances have been stored, released or disposed of on this property.

Results of the recent groundwater sampling program found no indication of significant groundwater contamination. Samples were analyzed for a wide range of potential contaminants of concern, including volatile organic compounds, semi-volatile organic compounds, PCBs, metals, cations/anions, metals including mercury, total uranium, gross alpha, gross beta, and a number of specific radionuclides (H-3, Co-60, Sr-90, Tc-99, Cs-137, U-233/234, U-235, U-236, U-238, Np-237, Pu-238, Pu-239/240, and Am-241). Results for most analytes were reported below detection limits for all samples. Validated laboratory results reported above detection limits without laboratory qualifiers included total uranium in two samples at 1.1 and 1.2 ug/L, isotopic uranium in two samples at 0.90 and 1.2 pCi/L, Cs-137 in one sample at 117 pCi/L, and Bis(2-ethylhexyl)-pthalate in one sample at 20 ug/L. Measurements of slightly elevated levels of gross alpha radioactivity were determined by the laboratory data validation program to be poorly reproducible and appear to be associated with suspended solids loadings of these samples; therefore, all gross alpha and gross beta results are qualified as "J" (estimated) data. Common metals and cations identified in all samples included aluminum, iron, manganese, calcium, magnesium, potassium, and sodium. All results indicated no evidence of significant site-related

contamination. No exceedances of primary maximum contaminant levels (MCLs) for drinking water were identified.

Based on estimates of radionuclide concentrations in near-shore sediments from the recent survey and sampling program conducted by TDEC, a hypothetical reasonably maximally exposed receptor would be estimated to incur an incremental lifetime cancer risk within the target risk range of 10^{-6} to 10^{-4} established under the National Contingency Plan. A recreational use scenario is considered most representative of likely exposure conditions in the floodplain and shoreline area, and the potential health risk for this scenario is estimated at approximately $1x10^{-6}$. Other scenarios considered include the "shoreline use" scenario defined in the RI/FS and a standard default residential scenario, with risk estimates of approximately 3×10^{-5} and 1×10^{-4}, respectively. However, these scenarios are likely to overestimate any actual exposures under the site-specific conditions and any actual risks to real receptors would be expected to be even lower than these estimates.

The maximum measured concentration of Cs-137 in near-shore sediment (4.4 pCi/g) is only a small multiple of the local background concentration (~ 0.72 pCi/g). Concentrations of Cs-137 throughout most of this site were not found to exceed background levels, and no exceedances were observed above the summer pool elevation where the property may be suitable for development. The maximum concentration of Cs-137 identified during the TDEC study was well below the action level of 15 pCi/g established by the Watts Bar Reservoir Interagency Permit Group, and also the screening level of 11.5 pCi/g derived under the Near-Shore Sediment Characterization Task of the Clinch River Environmental Restoration Program.

The potential radiation dose to a hypothetical receptor from exposure to shoreline sediments containing residual radioactive materials from the DOE-ORR is conservatively estimated in the range of approximately 0.1 to 2 mrem/year. This estimate represents exposure to a hypothetical maximally exposed individual, and any actual exposures would be expected to result in even lower doses. For purposes of comparison, current radiation protection guidelines endorsed by DOE and virtually all national and international radiation protection authorities limit the radiation dose to members of the public to 100 mrem/year above background from all sources (excluding medical- related exposures), and background exposure to radiation in the environment typically contributes a radiation dose of approximately 360 mrem/year to the average member of the public in the United States.

In summary, release of the DOE floodplain parcel adjacent to the Boeing Property for mixed use development would not be expected to result in an unacceptable risk to human health or the environment. No information to date indicates that hazardous substances have been stored, released or disposed of on this property. Results of this analysis indicate that the DOE-owned floodplain property adjacent to the Boeing Property is suitable for release as uncontaminated property under CERCLA Section 120(h)(4).

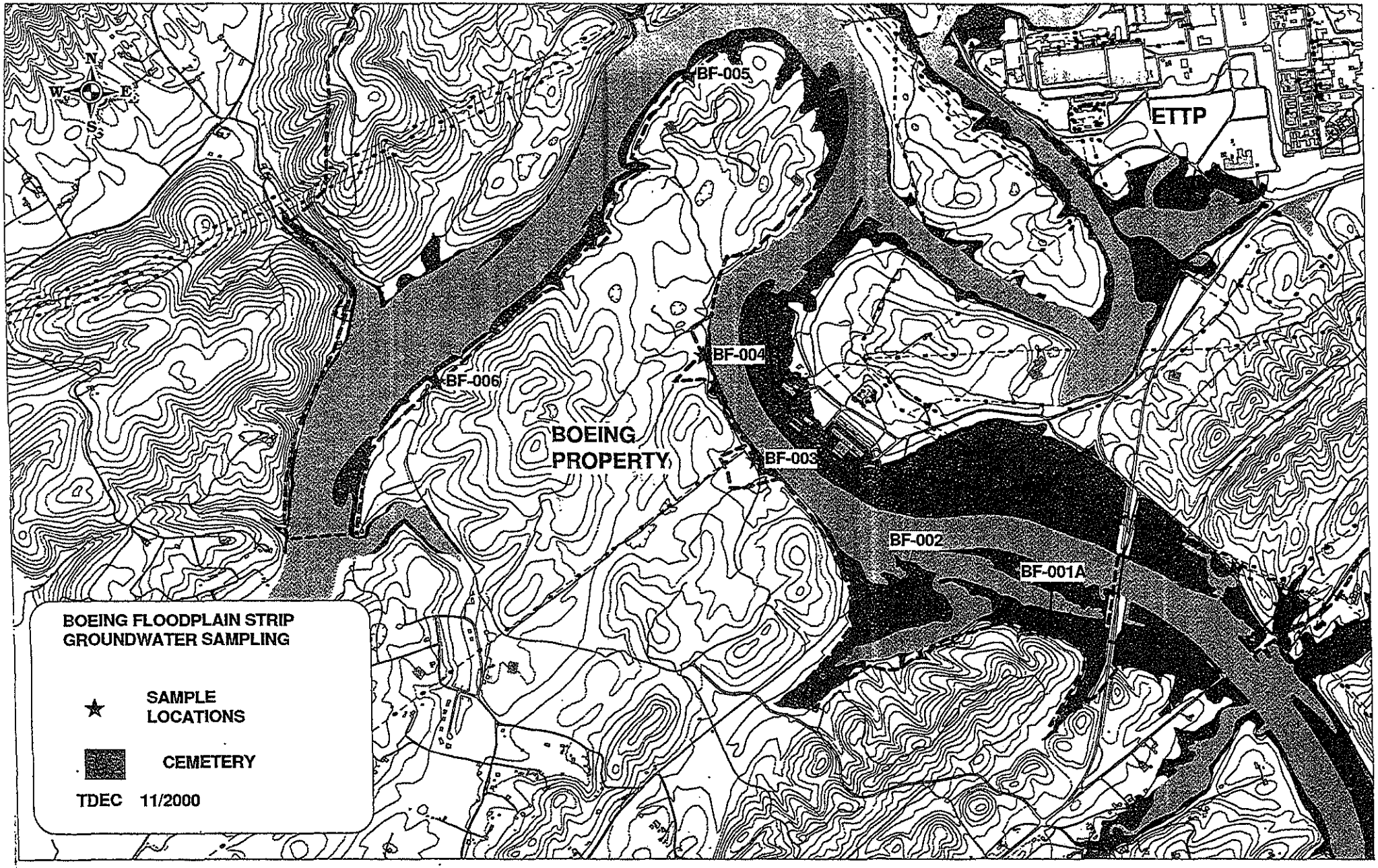


Figure 2. Boeing Floodplain Strip Groundwater Sampling Locations

Appendix C – Agency Consultation

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

January 17, 2001

Certified Mail
Return Receipt Requested

4WD-FFB

Myrna Redfield
Federal Facilities Project Manager
Office of Environmental Management
U.S. Department of Energy
Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831

Mildred Ferre
Y-12 Team Leader
Office of Environmental Management
U.S. Department of Energy
Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831

SUBJECT: Concurrence with Identification of Uncontaminated Property (Boeing Floodplain Strip) for Transfer Purposes under CERCLA § 120(h)(4)(B)

Dear Ms. Redfield and Ms. Ferre:

In response to your letter of Janaury 12, 2001, the Environmental Protection Agency (EPA) hereby concurs with the Department of Energy's (DOE's) identification of the Boeing Floodplain Strip as uncontaminated property, in accordance with §120(h)(4)(B) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Based on DOE's newly collected groundwater data; the information contained within "The Determination of Suitability for Release under CERCLA § 120(h)(4) for DOE Floodplain Strip Adjacent to the Boeing Property:" and

" CERCLA Section 120(h) Assessment for the Department of Energy Floodplain Strip Adjacent to the Boeing Property, Oak Ridge, Tennessee," EPA believes the Boeing Floodplain Strip is properly classified as "uncontaminated" as that term is used in CERCLA § 120(h)(4)(B). This conclusion is based on the risk assessment information presented relating to an unrestricted use scenario, taking into consideration site-specific conditions indicating that portions of this property are normally submerged for parts of the year. Although sediment and groundwater sampling information DOE has provided suggests that some historical release of hazardous substances may have occurred, this risk assessment information indicates that any such release has not caused levels of contamination on the property requiring remediation in order to ensure that human health and the environment will be protected under unlimited use/unrestricted exposure scenarios.

Consistent with the three-party Oak Ridge Reservation Federal Facility Agreement (FFA), the transfer documents between DOE and the transferee must contain notice of the existence and purpose of the FFA (Section XLIII-Property Transfer). Furthermore, the deed of transfer must contain certain covenants as specified in CERCLA § 120(h)(4)(D), one of which grants the United States continued access for any future remediation requirements, including those necessary to fulfill DOE's obligations under the FFA.

If you have any questions regarding this uncontaminated property determination concurrence, please call me at 404-562-8513.

Sincerely,

John Blevins
Oak Ridge Project Manager

cc: Pat Halsey, DOE-ORR
Oak Ridge SSAB
Oak Ridge LOC
City of Oak Ridge
Doug McCoy, TDEC
Lawrence Neville, EPA

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

September 28, 2000

Mr. Ray Moore
Cultural Resources
Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

RE: DOE, CLINCH RIVER PROPERTY CONVEYANCE, OAK RIDGE, ROANE COUNTY, TN

Dear Mr. Moore:

At your request, our office has reviewed the above-referenced additional documentation regarding the exclusion of archaeological sites 40RE86 and 40RE89 from the proposed property transfer in accordance with regulations codified at 36 CFR 800 (64 FR 27044, May 18, 1999). Based on the information provided, we find that the revised project area contains no archaeological resources eligible for listing in the National Register of Historic Places.

Therefore, this office has no objection to the implementation of this project. If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

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

HLH/jmb

OFFICIAL FILE COPY
AMESQ
Log No. 4778
Date Received OCT 6 2000
File Code 457.8.1.15

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

December 22, 2000

Ms. Martha Berry
U.S. Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-3104

Mr. Doug McCoy
Tennessee Department of Environment and Conservation
761 Emory Valley Road
Oak Ridge, Tennessee 37330-7072

Dear Ms. Berry and Mr. McCoy:

TRANSMITTAL OF THE DETERMINATION OF SUITABILITY FOR RELEASE UNDER CERCLA SECTION 120(H)(4) FOR THE DEPARTMENT OF ENERGY FLOODPLAIN STRIP ADJACENT TO THE BOEING PROPERTY

The purpose of this letter is to transmit the above referenced document for your information and review. The Department of Energy (DOE) is in the process of finalizing an Environmental Assessment (EA) of the proposed property transfer. If the EA supports reaching a Finding of No Significant Impact, DOE plans on transferring the property in January, 2001.

The environmental condition of the subject property and an evaluation of any potential risks to human health have been evaluated in the enclosed document. The data collected, analyzed, and evaluated are consistent with the agreements that have been reached regarding data sufficiency and risk assessment methodology. DOE has concluded, based upon this data, that the property is uncontaminated. Section 120(h)(4) of the Comprehensive Environmental Response, Compensation, Liability Act provides for Environmental Protection Agency (EPA) concurrence in the identification of uncontaminated property for transfers subject to those provisions. DOE is requesting that EPA provide its concurrence on the identification of this property as uncontaminated.

If you have any questions regarding the enclosed documents or the Department's plans for transfer of the Boeing floodplain property, please contact me at (865) 576-8528.

Sincerely,

Myrna E. Redfield
Federal Facility Agreement
Project Manager
ORR Remediation Management Group

Enclosure

cc w/enclosure:
Mark Belvin, EPA, Region 4
Jon Johnston, EPA, Region 4
Robert Storms, TDEC/DOE-O
Katy Kates, AD-42, ORO

Tennessee Valley Authority, Post Office Box 1589, Norris, Tennessee 37828-1589

Ruben O. Hernandez
Vice President
Resource Stewardship

August 31, 2000

Mr. Fredrich H. Thomforde, Jr.
Becker, Thomforde, Brown & Knight, P.C.
Attorneys at Law
Post Office Box 1710
Knoxville, Tennessee 37901-1710

Dear Mr. Thomforde:

WATTS BAR RESERVOIR - TRACT NO. XTWBR-121 - INQUIRY REGARDING CONSIDERATION OF SECTION 26A PERMITS - MAP NOS. 56D AND 57D

This is in response to your July 18 request to Barry B. Walton for a letter from TVA addressing our position on the issuance of shoreline facility permits across Tract No. XTWBR-121 and is based on the following assumptions: (1) the U.S. Department of Energy (DOE) transfers to the developer the strip of land that it owns between the Boeing property line and the 741-foot contour line, and (2) DOE also agrees to permit the developer (or the ultimate lot owners) to build docks over or attached to its property that lies underwater beyond the 741-foot contour.

In this case, before TVA would agree to process dock applications, two requirements would have to be met. (1) The access rights across the remaining DOE property should be deeded rights. For instance, if the deed of purchase of the land above the 741-foot contour also grants the right of ingress to and egress from the waters of Melton Hill Reservoir and also the right to construct, maintain, and use water use facilities on, over, and across the adjoining land owned by the United States in the custody of DOE, such arrangements would be consistent with TVA's policy for consideration of dock approvals. (2) TVA would require the developer to agree to the following:

- The preparation and submission to TVA for approval of a shoreline management plan that: (1) establishes 100 feet deep conservation buffers on the private property; (2) requires the use of community facilities, as defined by TVA where necessary in

- specific locations, as opposed to the construction of individual facilities; (3) delineates acceptable development areas; (4) specifies facility locations and designs; and (5) defines vegetation management plans and identifies shoreline management zones and pedestrian access corridors, consistent with TVA's Shoreline Management Policy criteria, prior to conveyance of lots.The incorporation of the above standards and design specifications into subdivision covenants and deeds.

An outcome of these commitments is the establishment of long-term conservation practices for future development. All requests for docks would be subject to TVA's Section 26a jurisdiction and processed in accordance with TVA Section 26a regulations.

At such time as the sale of the subject tract is brought to closure with your clients and DOE, please arrange for us to meet with the individuals who are authorized to act on behalf of the potential developer. Should you have any questions, please contact Michael R. Crowson, Manager, Melton Hill Watershed Team, at (865) 988-2445.

Sincerely,

Ruben O. Hernandez

cc: Ms. Katy Kates
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831-8722

(Please consider this letter as official TVA input toward the ongoing environmental review process on the disposal of the subject properties.)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

August 8, 2000

Dr. James L. Elmore
Alternate ORO NEPA Compliance Officer
Department of Energy
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Dr. Elmore:

Thank you for your letter of July 31, 2000, forwarding new information concerning the proposed transfer of approximately 182 acres of Oak Ridge Reservation land to the privately owned Oak Ridge Land Company, LLC, in Roane County, Tennessee. Based on the information provided, we recommend that a qualified biologist assess potential impacts of the proposed transfer of property and potential development on the federally endangered Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*). This recommendation supercedes information contained in our letter of April 26, 2000, to Ms. Katy Kates.

Thank you for the opportunity to comment further on this action. If you have any questions regarding the information which we have provided, please contact Wally Brines of my staff at 931/528-6481, extension 222.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL # of pages ▸ 1

To Kent Subbage	From Sandra Silvey
Dept./Agency Tetra Tech	Phone # 931-528-6481
Fax # 803-642-8454	Fax # " " 7075

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

July 31, 2000

Dr. Lee A. Barclay, Field Supervisor
Fish and Wildlife Service
U.S. Department of Interior
446 Neal Street
Cookeville, Tennessee 38501

Dear Dr. Barclay:

FURTHER INFORMAL CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT FOR PROPOSED TRANSFER OF OAK RIDGE RESERVATION LAND

The U.S. Department of Energy has sent two letters to you previously about a project to transfer property between the Boeing Property and the Clinch River to the Oak Ridge Land Company, LLC. One of these letter dated March 27, 2000, was from me and the other dated April 20, 2000, was from Katy Kates. The purpose of this letter is to convey new information to you about the transfer and get some indication from you as to whether this changes your latest determination on the project (dated April 26, 2000).

Although current plans, as stated in our April 20, 2000, letter, are for the land to be left virtually undeveloped and in its natural state, there is the potential for some future development that might be expected in a riverside location, such as floating docks and associated small buildings, a marina, walking trails, and some brush and tree clearing. The Environmental Assessment (EA) being prepared for this project will assess the impacts of these potential actions as a result of the land transfer. The industrial, commercial, and residential development of the adjacent 1217-acre Boeing parcel will be treated as a connected action in the EA. Also, instead of transferring the entire floodplain area to the Oak Ridge Land Company, it is now intended to transfer only land above the ordinary high water mark.

This project is on a tight schedule, so anything that you could do to expedite your reply would be greatly appreciated. Please contact me at 865-576-0938 or send a fax to me at 865-576-0746 as soon as you make your determination so that we can initiate the appropriate response action. If you need further information concerning this request, please feel free to contact me at the above telephone number.

Sincerely,

James L. Elmore

James L. Elmore, Ph.D.
Alternate ORO NEPA Compliance Officer

cc:
Mark Belvin, SE-32
Katy Kates, AD-424

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▸ 1

To Kent Cubbage	From Katy Kates
Dept./Agency	Phone #
Fax # 803-642-8454	Fax # 865-576-9204

NSN 7540-01-317-7388 5099-101 GENERAL SERVICES ADMINISTRATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

April 26, 2000

Ms. Katy Kates
Realty Officer
Department of Energy
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Kates:

The Fish and Wildlife Service has reviewed the information facsimile transmitted to our office on April 24, 2000, regarding the potential presence of Indiana bats (*Myotis sodalis*) and gray bats (*Myotis grisescens*) on the182 acres of the Oak Ridge Reservation land proposed for transfer to the privately owned Oak Ridge Land Company, LLC in Roane County, Tennessee.

Based on the information provided, we anticipate that the proposed land transfer will have no effect on these species. Therefore, we believe that the requirements of Section 7 of the Endangered Species Act (Act) have been fulfilled and that no further consultation is needed at this time. However, obligations under Section 7 of the Act must be reconsidered if: (1) new information reveals that the proposed action may affect listed species in a manner or to an extent not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered in this biological assessment, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Your interest and initiative to protect endangered and threatened species is greatly appreciated. If you have questions or if we can be of further assistance, please contact Wally Brines of my staff at 931/528-6481, extension 222.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

xc: James L. Elmore, DOE

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

April 20, 2000

Dr. Lee A. Barclay, Field Supervisor
Fish & Wildlife Service
U.S. Department of Interior
Attention: Wally Brines
446 Near Street
Cookeville, Tennessee 38501

Dear Mr. Brines:

INFORMAL CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT FOR PROPOSED TRANSFER OF OAK RIDGE RESERVATION LAND

I refer to the following:

a. Department of Energy (DOE) letter from James Elmore dated March 27, 2000 addressed to Dr. Barclay.

b. Fish & Wildlife Service (F&WL) response dated April 12, 2000 signed by Dr. Barclay and addressed to Mr. Elmore.

c. Our telephone conversation on today's date concerning the F&WL letter which addressed the potential for two bat species in the vicinity.

As the program manager accomplishing this action, I discussed with you in greater detail the proposed project affecting DOE's 182-acre floodplain strip which abuts a larger 1217-acre parcel owned by a private entity. The proposed purchaser of the larger parcel will be developing that land for residential, commercial, and possibly industrial use. The smaller DOE-owned strip lies totally within the 500-year floodplain and is subject to a restrictive flowage easement by TVA. It is acknowledged that TVA has rights to fell and cut timber that could interfere with navigation or flood control, or tend to render inaccessible, unsafe or unsanitary the waters of the Clinch River or Watts Bar Lake. However, it is the intent of the purchaser and developer to leave the floodplain strip of land virtually undeveloped and in its natural state.

Because the proposed purchaser must bear the costs for all environmental documentation, etc., the need to retain a biologist to accomplish an assessment on land that was to remain in a natural state was questioned by that company. You indicated that you were appreciative of learning the additional comments discerned through our conversation and asked that a letter be forwarded stating that the parcel would remain undeveloped. Accordingly, this letter is forwarded to you to serve that purpose. Additionally, the conveyance document will include a provision with the following suggested language:

"If said land is used in a manner inconsistent with the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq), title to the land and all improvements affected by the breach of this condition will revert to and be vested in the United States of America."

May I also thank you for your professionalism, patience, and courtesy in taking the time to explain a portion of the activities involved with your position. I know that I already had a great appreciation for the work your agency does and your assistance in educating me on various aspects affecting my action has further strengthened that appreciation and trust.

If you have any questions, please feel free to call me at 865-576-0977.

Sincerely,

Katy Kates

Katy Kates
Realty Officer

cc: James L. Elmore, SE-32

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

April 12, 2000

Mr. James L. Elmore
Alternate ORO NEPA Compliance Officer
Department of Energy
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Elmore:

Thank you for your letter and enclosures of March 27, 2000, regarding the proposed transfer of approximately182 acres of Oak Ridge Reservation land to the privately owned Oak Ridge Land Company, LLC in Roane County, Tennessee. The Oak Ridge Land Company, LLC proposes to develop the land for industrial, commercial, and residential uses. The Fish and Wildlife Service (Service) has reviewed the information submitted and offers the following comments.

Information available to the Service indicates that wetlands exist in the vicinity of the proposed project. Attached is a copy of a portion of the National Wetlands Inventory's Elverton, Tennessee, quadrangle with the referenced wetlands highlighted. This information is provided for your convenience. Our wetlands determination has been made in the absence of a field inspection and does not constitute a wetlands delineation for the purposes of Section 404 of the Clean Water Act. The Corps of Engineers should be contacted regarding the presence of regulatory wetlands and the requirements of wetlands protection statutes.

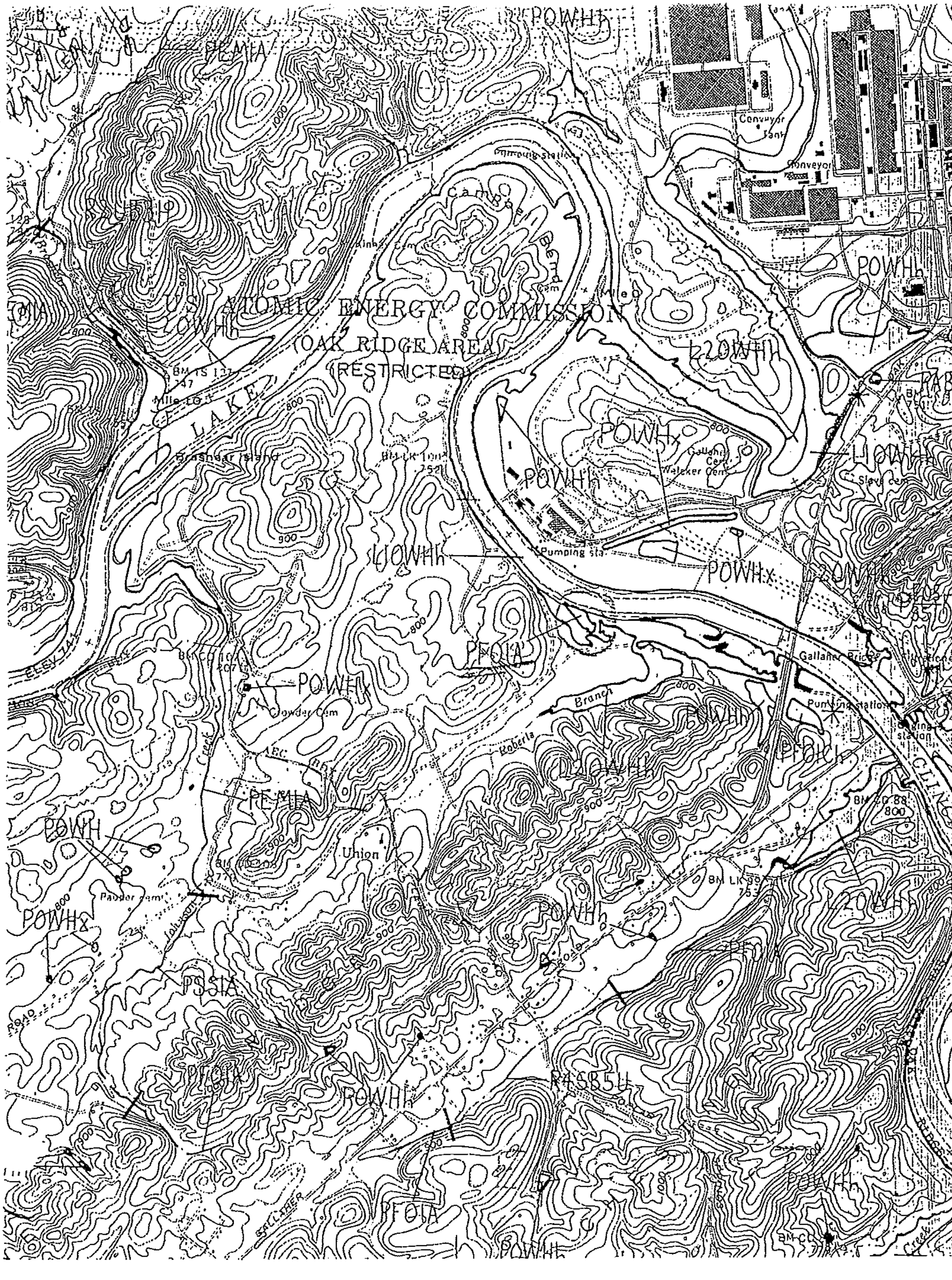
According to our records, the federally endangered Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*) may occur in the project impact area. A qualified biologist should assess potential impacts and determine if the proposed project may affect these species. A finding of "may affect" could require initiation of formal consultation. We recommend that you submit a copy of your assessment and finding to this office for review and concurrence.

Thank you for the opportunity to comment on this proposed action. If you have any questions regarding the information which we have provided, please contact Wally Brines of my staff at 931/528-6481, extension 222.

Sincerely,

for Lee A. Barclay, Ph.D.
Field Supervisor

Attachment


U.S. ATOMIC ENERGY COMMISSION
(OAK RIDGE AREA)
(RESTRICTED)
LAKE
Brashear Island
Pumping station
Pumping sta.
Conveyor
Gallaher Bridge
Gallaher Cem
Walker Cem
Crowder Cem
Branch
Roberts
Union
Mile 10
POWHh
POWHx
POWH
PEMIA
PFOIA
PFOIC
PSSIA
L1OWHh
L2OWHh
R4SB5u
800
900

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831---

March 27, 2000

Dr. Lee A. Barclay, Field Supervisor
Fish and Wildlife Service
U.S. Department of Interior
446 Neal Street
Cookeville, Tennessee 38501

Dear Dr. Barclay:

INFORMAL CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT FOR PROPOSED TRANSFER OF OAK RIDGE RESERVATION LAND

The U.S. Department of Energy (DOE) has requested that a pending land purchaser prepare an environmental report for the proposed conveyance of approximately 182 acres of land on DOE's Oak Ridge Reservation. Once DOE receives and reviews this report for adequacy, DOE will accomplish further action to incorporate the report into an Environmental Assessment (EA).

The proposed transfer consists of land comprising the 500-year floodplain that abuts the Boeing property located in Roane County, Tennessee. Oak Ridge Land Company, LLC, proposes to acquire both the 1217-acre Boeing parcel and the 182-acre DOE floodplain parcel in order to develop the land for mixed use. This mixed used will include industrial, commercial, and residential improvements. Rezoning for this development was approved by the Oak Ridge City Council in February 2000. A map showing DOE's floodplain ownership is enclosed depicting the area.

This letter is intended to serve as informal consultation under Section 7 of the Endangered Species Act. In this regard, DOE requests an updated list of protected species and habitats on the floodplain area and solicits your recommendations and comments about the potential effects of this action. Your input will be used in the preparation of the EA and in potential language to be contained within the conveyance document.

If you need further information concerning this request, please feel free to contact me at 865-576-0938 or Katy Kates at 865-576-0977.

Sincerely,

James L. Elmore
Alternate ORO NEPA Compliance Officer

Enclosure
As stated

cc: Katy Kates, AD-42
David Allen, SE-32
Dan Wilken, AD-40
Robert Storm, TDEC/DOE-O

U.S. Fish & Wildlife Service

Threatened and Endangered Species System (TESS)

Threatened and Endangered Species by State and Territory, as of 8/1/2000

Notes:

- *Does not include experimental populations or similarity of appearance species.*
- *Pertains to the range of a species, not the listing status within a State/Territory.*
- *Includes non-nesting sea turtles and whales in State/Territory coastal waters.*
- *Includes species under the sole jurisdiction of the National Marine Fisheries Service.*

This page last updated on Tuesday, July 25, 2000 01:04:04 PM.
Go to the Threatened and Endangered Wildlife and Plants Page
Go to the TESS Home Page

TABLE OF CONTENTS

- New Jersey -- 21 species
- New Mexico -- 38 species
- New York -- 24 species
- North Carolina -- 57 species
- North Dakota -- 9 species
- Ohio -- 23 species
- Oklahoma -- 16 species
- Oregon -- 44 species
- Pennsylvania -- 17 species
- Rhode Island -- 16 species
- South Carolina -- 39 species
- South Dakota -- 10 species
- Tennessee -- 88 species
- Texas -- 79 species
- Utah -- 40 species
- Vermont -- 8 species
- Virginia -- 61 species
- Washington -- 29 species
- West Virginia -- 20 species
- Wisconsin -- 15 species
- Wyoming -- 12 species
- American Samoa -- 4 species
- Guam -- 14 species
- Northern Mariana Islands -- 12 species
- Puerto Rico -- 75 species
- Virgin Islands -- 15 species
- Outlying Carribean Islands -- 0 species
- Outlying Pacific Islands -- 0 species

- ***Click on the highlighted scientific names below to view a Species Profile for each species.***
- ***Generate a comma or tab delimited version of this report.***

Alabama -- 105 species

Animals -- 87

Status	*Species Name*
E	Acornshell, southern (*Epioblasma othcaloogensis*)
T	Bankclimber, purple (*Elliptoideus sloatianus*)
E	Bat, gray (*Myotis grisescens*)
E	Bat, Indiana (*Myotis sodalis*)
E	Blossom, turgid (*Epioblasma turgidula*)
E	Blossom, yellow (*Epioblasma florentina florentina*)
E	Campeloma, slender (*Campeloma decampi*)
E	Catspaw (*Epioblasma obliquata obliquata*)
E	Cavefish, Alabama (*Speoplatyrhinus poulsoni*)
T	Chub, spotfin (*Cyprinella monacha*)
E	Clubshell, black (*Pleurobema curtum*)

E	Beetle, American burying (*Nicrophorus americanus*)
E	Crane, whooping (*Grus americana*)
E	Curlew, Eskimo (*Numenius borealis*)
T	Eagle, bald (*Haliaeetus leucocephalus*)
E	Ferret, black-footed (*Mustela nigripes*)
T	Plover, piping (*Charadrius melodus*)
E	Shiner, Topeka (*Notropis topeka*)
E	Sturgeon, pallid (*Scaphirhynchus albus*)
E	Tern, least (*Sterna antillarum*)
E	Wolf, gray (*Canis lupus*)

Plants -- 0

Tennessee -- 88 species

Animals -- 68

Status	*Species Name*
E	Acornshell, southern (*Epioblasma othcaloogensis*)
E	Bat, gray (*Myotis grisescens*)
E	Bat, Indiana (*Myotis sodalis*)
E	Bean, Cumberland (*Villosa trabalis*)
E	Bean, purple (*Villosa perpurpurea*)
E	Blossom, green (*Epioblasma torulosa gubernaculum*)
E	Blossom, tubercled (*Epioblasma torulosa torulosa*)
E	Blossom, turgid (*Epioblasma turgidula*)
E	Blossom, yellow (*Epioblasma florentina florentina*)
E	Catspaw (*Epioblasma obliquata obliquata*)
T	Chub, slender (*Erimystax cahni*)
T	Chub, spotfin (*Cyprinella monacha*)
E	Clubshell, ovate (*Pleurobema perovatum*)
E	Clubshell, southern (*Pleurobema decisum*)
E	Combshell, Cumberlandian (*Epioblasma brevidens*)
E	Combshell, upland (*Epioblasma metastriata*)
E	Crayfish, Nashville (*Orconectes shoupi*)
T	Dace, blackside (*Phoxinus cumberlandensis*)
E	Darter, amber (*Percina antesella*)
E	Darter, bluemask (*Etheostoma sp.*)
E	Darter, boulder (*Etheostoma wapiti*)
E	Darter, duskytail (*Etheostoma percnurum*)
T	Darter, slackwater (*Etheostoma boschungi*)
T	Darter, snail (*Percina tanasi*)
T	Eagle, bald (*Haliaeetus leucocephalus*)
E	Elktoe, Appalachian (*Alasmidonta raveneliana*)
E	Elktoe, Cumberland (*Alasmidonta atropurpurea*)
E	Fanshell (*Cyprogenia stegaria*)
E	Kidneyshell, triangular (*Ptychobranchus greeni*)

E	Lampmussel, Alabama (*Lampsilis virescens*)
E	Lilliput, pale (*Toxolasma cylindrellus*)
E	Logperch, Conasauga (*Percina jenkinsi*)
E	Madtom, pygmy (*Noturus stanauli*)
E	Madtom, smoky (*Noturus baileyi*)
T	Madtom, yellowfin (*Noturus flavipinnis*)
E	Mapleleaf, winged (*Quadrula fragosa*)
E	Marstonia, royal (*Pyrgulopsis ogmorhaphe*)
T	Moccasinshell, Alabama (*Medionidus acutissimus*)
E	Moccasinshell, Coosa (*Medionidus parvulus*)
E	Monkeyface, Appalachian (*Quadrula sparsa*)
E	Monkeyface, Cumberland (*Quadrula intermedia*)
E	Mucket, pink (*Lampsilis abrupta*)
E	Mussel, oyster (*Epioblasma capsaeformis*)
E	Pearlymussel, birdwing (*Conradilla caelata*)
E	Pearlymussel, cracking (*Hemistena lata*)
E	Pearlymussel, dromedary (*Dromus dromas*)
E	Pearlymussel, littlewing (*Pegias fabula*)
E	Pearlymussel, white wartyback (*Plethobasus cicatricosus*)
E	Pigtoe, Cumberland (*Pleurobema gibberum*)
E	Pigtoe, finerayed (*Fusconaia cuneolus*)
E	Pigtoe, rough (*Pleurobema plenum*)
E	Pigtoe, shiny (*Fusconaia cor*)
E	Pigtoe, southern (*Pleurobema georgianum*)
E	Pimpleback, orangefoot (*Plethobasus cooperianus*)
T	Pocketbook, finelined (*Lampsilis altilis*)
E	Puma, eastern (*Puma concolor couguar*)
E	Rabbitsfoot, rough (*Quadrula cylindrica strigillata*)
E	Riffleshell, tan (*Epioblasma florentina walkeri*)
E	Ring pink (*Obovaria retusa*)
E	Riversnail, Anthony's (*Athearnia anthonyi*)
T	Shiner, blue (*Cyprinella caerulea*)
T	Snail, painted snake coiled forest (*Anguispira picta*)
E	Spider, spruce-fir moss (*Microhexura montivaga*)
E	Squirrel, Carolina northern flying (*Glaucomys sabrinus coloratus*)
E	Sturgeon, pallid (*Scaphirhynchus albus*)
E	Tern, least (*Sterna antillarum*)
E	Wolf, red (*Canis rufus*)
E	Woodpecker, red-cockaded (*Picoides borealis*)

Plants -- 20

Status	*Species Name*
T	Potato-bean, Price's (*Apios priceana*)
E	Rock-cress, Braun's (*Arabis perstellata*)
E	Sandwort, Cumberland (*Arenaria cumberlandensis*)
T	Fern, American hart's-tongue (*Asplenium scolopendrium americanum*)
E	Ground-plum, Pyne's (*Astragalus bibullatus*)
T	Rosemary, Cumberland (*Conradina verticillata*)

E	Prairie-clover, leafy (*Dalea foliosa*)
E	Coneflower, Tennessee purple (*Echinacea tennesseensis*)
E	Avens, spreading (*Geum radiatum*)
E	Lichen, rock gnome (*Gymnoderma lineare*)
E	Bluet, Roan Mountain (*Hedyotis purpurea montana*)
T	Sunflower, Eggert's (*Helianthus eggertii*)
T	Pogonia, small whorled (*Isotria medeoloides*)
E	Bladderpod, Spring Creek (*Lesquerella perforata*)
E	Aster, Ruth's golden (*Pityopsis ruthii*)
E	Pitcher-plant, green (*Sarracenia oreophila*)
E	Skullcap, large-flowered (*Scutellaria montana*)
T	Goldenrod, Blue Ridge (*Solidago spithamaea*)
T	Spiraea, Virginia (*Spiraea virginiana*)
E	Grass, Tennessee yellow-eyed (*Xyris tennesseensis*)

Texas -- 79 species

Animals -- 51

Status	*Species Name*
E	Amphipod, Peck's cave (*Stygobromus pecki*)
E	Bat, Mexican long-nosed (*Leptonycteris nivalis*)
T	Bear, Louisiana black (*Ursus americanus luteolus*)
E	Beetle, Coffin Cave mold (*Batrisodes texanus*)
E	Beetle, Comal Springs dryopid (*Stygoparnus comalensis*)
E	Beetle, Comal Springs riffle (*Heterelmis comalensis*)
E	Beetle, Kretschmarr Cave mold (*Texamaurops reddelli*)
E	Beetle, Tooth Cave ground (*Rhadine persephone*)
E	Crane, whooping (*Grus americana*)
E	Curlew, Eskimo (*Numenius borealis*)
E	Darter, fountain (*Etheostoma fonticola*)
T	Eagle, bald (*Haliaeetus leucocephalus*)
E	Falcon, northern aplomado (*Falco femoralis septentrionalis*)
E	Flycatcher, southwestern willow (*Empidonax traillii extimus*)
E	Gambusia, Big Bend (*Gambusia gaigei*)
E	Gambusia, Clear Creek (*Gambusia heterochir*)
E	Gambusia, Pecos (*Gambusia nobilis*)
E	Gambusia, San Marcos (*Gambusia georgei*)
E	Harvestman, Bee Creek Cave (*Texella reddelli*)
E	Harvestman, Bone Cave (*Texella reyesi*)
E	Jaguar (*Panthera onca*)
E	Jaguarundi, Gulf Coast (*Herpailurus yagouaroundi cacomitli*)
E	Manatee, West Indian (*Trichechus manatus*)
T	Minnow, Devils River (*Dionda diaboli*)
E	Minnow, Rio Grande silvery (*Hybognathus amarus*)
E	Ocelot (*Leopardus pardalis*)
T	Owl, Mexican spotted (*Strix occidentalis lucida*)
E	Pelican, brown (*Pelecanus occidentalis*)

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

May 1, 2000

Andrew N. Barrass
Environmental Review Coordinator
Division of Natural Heritage
State of Tennessee
Department of Environment and Conservation
401 Church Street
Nashville, Tennessee 37243-0443

Dear Mr. Barrass:

TRANSFER OF FLOODPLAIN STRIP ALONG CLINCH RIVER, OAK RIDGE RESERVATION, TN

I refer to the following:

a. Department of Energy (DOE) letter from James Elmore dated March 30, 2000 addressed to Reginald Reeves.

b. Your letter of response dated April 24, 2000 addressed to James Elmore.

As the program manager accomplishing this action, I am responding to your letter in order to thank you for your comments and further explain the nature of the transfer. The Boeing parcel of land which contains 1217 acres has been under private ownership since 1987. DOE retained approximately 182 acres identified as the floodplain strip of land which surrounded the parcel on two sides. This land is now excess to DOE's needs and, in order to avoid creating an uneconomic encumbrance to the adjacent owner, will be conveyed to whomever the abutting landowner of the Boeing parcel is at the time DOE is ready to divest itself of title.

A local company has an option to acquire the Boeing parcel to develop it for residential, commercial, and possibly industrial uses. The proposed purchaser requested acquisition of the smaller excess DOE-owned strip of land for the purpose of holding title to the complete peninsula-type parcel. That strip lies totally within the 500-year floodplain and is subject to a restrictive flowage easement by TVA. The floodplain strip will remain virtually undeveloped and in its natural state. Although access for a commercial boat dock may be granted by TVA over a small portion of the area, as stated above, the entire floodplain strip is subject to TVA's easement over the area and to that agency's right to issue such permission.

Because the proposed purchaser must bear the costs for all environmental documentation, etc., the need to retain professional personnel to accomplish a comprehensive biological survey on land that is to remain in a natural state was questioned by that company. Accordingly, in order to protect any possible unknown threatened or endangered species, DOE has opted to place a provision within the conveyance document as follows:

"If said land is used in a manner inconsistent with the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq), title to the land and all improvements affected by the breach of this condition will revert to and be vested in the United States of America."

Thank you for your comments relating to this action. Please feel free to call me at 865-576-0977 for any questions you may have.

Sincerely,

Katy Kates

Katy Kates
Realty Officer

cc: James Elmore, SE-32
Dan Wilken, AD-40
Lee Barclay, U.S. Fish & Wildlife Service

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

April 24, 2000

OFFICIAL FILE COPY
AMESQ
Log No. 2000-000 669
Date Received APR 26 2000
File Code

Mr. James L. Elmore
U.S. Department Energy
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge TN 37831

Subject: Department of Energy Land Transfer of Boeing and DOE parcels along Clinch River, Roane County TN; Project review information for rare, threatened, or endangered species; ecologically sensitive sites; and managed areas

Dear Mr. Elmore:

We have reviewed our Departmental data bases and find recorded rare, threatened and/or endangered species, within a one mile radius of the proposed project and at sites downstream of the proposed project area. These species are found in very specific or rare habitat. The review is for the proposed Preliminary Project review, Department of Energy Land Transfer of Boeing and DOE parcels, near Campbell Bend area, along Clinch River, Roane County TN project site(s). As per your request, the species that have recorded occurrences are listed by species name. Please see the attached (**Attachment 1**) habitat and quad map listings for further information. Also, please see **Attachment 2**, GIS information map.

The results of our review do not mean that a comprehensive biological survey has been completed. Because of the presence of threatened or endangered species near the project area (within a mile radius), it is probable that those species will occur in the project area if suitable habitat exists. Therefore, we would *recommend* that a survey of the project sites be conducted prior to project implementation. Please notify our office of your findings. Our records also indicate additional species occurrence records within an approximate four mile radius of the proposed project site(s). The species that have recorded occurrences are listed by county listing and are attached. Please do not make public the exact location of any element listed here-in, as this could lead to possible over-collection and abuse.

Please be advised, however, that this information is sensitive to the protection of rare habitat, threatened or endangered species, and natural areas which our Department has the responsibility

to protect. Therefore, we would request that this information only be used as a research tool by professional staff and not be made available to the public or anyone outside of your office/Department.

In order to comply with the National Environmental Policy Act consideration should be given to the comprehensive and *cumulative* impacts associated with the project actions. Based upon the information provided, it is probable that any proposed stream crossing or instream work will impact instream, aquatic, habitat and riparian habitat as part of the project implementation.

Any restoration activities should include the use of native plant species. Restoration should be accomplished by using native plant species consistent with local community types.

Techniques for sediment retention and streamside reconstruction are outlined in the following documents prepared by our Department:

1. **Tennessee Erosion Control Handbook, July 1992.**
2. **Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites, March 1992.**
3. **Riparian Restoration and Streamside Erosion Control Handbook, November 1994 (Revised April 1998).**

Please refer to these documents when planning measures to lessen any project or construction impacts.

We appreciate the opportunity to assist you with your pre-project planning. If we can be of further assistance with your project please contact our office in Nashville, telephone 615/532-0431.

Respectfully,

Andrew N. Barrass Ph. D.,
Environmental Review Coordinator
Division of Natural Heritage

Attachments: (2)

cc:
Mr. Earl Leming, DOEO-TDEC
Mr. Dan Sherry, TWRA
Mr. Lee Barclay, Ph. D., U.S. Fish and Wildlife Service

Attachment 1

Habitat Information for State and/or Federally Listed Species and Critical or Sensitive Habitat For Locations Within a One Mile Radius of the Project Site

The following habitat description(s) has been retrieved from our national data base for the purpose of scientific field review and population determinations.

One mile radius search:

Spiny Pigtoe: [*1918, 1919*]
FUSCONAIA EDGARIANA *Found in shoals and riffles in clear streams with moderate to fast current. Sand and gravel bottom. (Hickman, 1937)**

Pyramid Pigtoe: *[1983, 1984]*
PLEUROBEMA RUBRUM *This mussel typically inhabits large rivers but may occur in medium-sized lotic environments. It tends to occupy riffles or shoals in relatively shallow water and coarse-particle substrates, along sand bars, or in deep water (>4 m) with mud and sand bottoms. Moderate to swift currents usually are associated with these habitats (Gordon and Layzer, 1989). It persists below some Tennessee River dams in sub-lotic zones of the next reservoir which have substantial currents from power releases.**

Osprey: *[1990, 1994, & 1997]*
PANDION HALIAETUS *Primarily along rivers, lakes, reservoirs, and seacoasts, occurring widely in migration, often crossing land between bodies of water (AOU 1983).**

Woodland Jumping Mouse: : *[1995]*
NAPAEOZAPUS INSIGNIS *Prefers deciduous and coniferous forests with herbaceous groundcover. Also in brush-lands. When inactive, occupies underground burrow (winter) or nest in log, stump, or under other cover.**

[species occurrence or record date and file or survey information]

Because the habitat for the animal species listed is very specific, you may wish to request further information from Mr. Smoot Major, in our office in Nashville. He may be reached by telephone at 615/741-9141.

The plant species, Spreading False-Foxglove, *Aureolaria patula*, Appalachian Bugbane, *Cimicifuga rubifolia*, Tall Larkspur, *Delphinium exaltatum*, Branching Whitlow-Grass, *Draba ramosissima*, Heller's Catfoot, *Gnaphalium helleri*, Goldenseal, *Hydrastis canadensis*, and Canada Lily, *Lilium canadense* are found near the proposed project corridor and along the stream banks.

Because the habitat for the plant species listed is very specific, you may wish to request further information from our Rare Plant Species Coordinator, Ms. Andrea Shea, or our Botanist, Mr. Carl Nordman, in our office in Nashville. They may be reached by telephone at 615/532-0431.

Note:
Should the project require further environmental program permits from our Department, please attach a complete copy of this review or assessment to the permit application.

LIST OF RARE AND ENDANGERED SPECIES BY TENNESSEE COUNTY

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
**** Roane County TN			
** ALL PLANTS			
ASPLENIUM SCOLOPENDRIUM VAR AMERICA	HART'S-TONGUE FERN	LT	E
** INVERTEBRATES - MOLLUSC			
ATHEARNIA ANTHONYI	ANTHONY'S RIVER SNAIL	LE	E
EPIOBLASMA TURGIDULA	TURGID-BLOSSOM	LE	E
FUSCONAIA CUNEOLUS	FINE-RAYED PIGTOE	LE	E
FUSCONAIA EDGARIANA	SHINY PIGTOE	LE	E
IO FLUVIALIS	SPINY RIVERSNAIL		
LAMPSILIS ABRUPTA	PINK MUCKET	LE	E
LAMPSILIS VIRESCENS	ALABAMA LAMP MUSSEL	LE	E
LITHASIA GENICULATA	ORNATE ROCKSNAIL		
PLETHOBASUS COOPERIANUS	ORANGE-FOOT PIMPLEBACK	LE	E
PLEUROBEMA RUBRUM	PYRAMID PIGTOE		
QUADRULA CYLINDRICA STRIGILLATA	ROUGH RABBITSFOOT PEARLY MUSSEL	LE	
VILLOSA PERPURPUREA	PURPLE BEAN	LE	E
** Other types			
HERON ROOKERY	HERON ROOKERY		
** ALL PLANTS			
AGALINIS AURICULATA	EARLEAVED FALSE-FOXGLOVE		E
ASTER PRATENSIS	BARRENS SILKY ASTER		T
AUREOLARIA PATULA	SPREADING FALSE-FOXGLOVE		T
CIMICIFUGA RUBIFOLIA	APPALACHIAN BUGBANE		T
DELPHINIUM EXALTATUM	TALL LARKSPUR		E
DIERVILLA LONICERA	NORTHERN BUSH-HONEYSUCKLE		T
DIERVILLA SESSILIFOLIA VAR RIVULARI	MOUNTAIN BUSH-HONEYSUCKLE		T
DRABA RAMOSISSIMA	BRANCHING WHITLOW-GRASS		S
GNAPHALIUM HELLERI	HELLER'S CATFOOT		S
HYDRASTIS CANADENSIS	GOLDENSEAL		S-CE
JUGLANS CINEREA	BUTTERNUT		T
LEUCOTHOE RACEMOSA	FETTER-BUSH		T
LIATRIS CYLINDRACEA	SLENDER BLAZING-STAR		T
LONICERA DIOICA	MOUNTAIN HONEYSUCKLE		S
MARSHALLIA GRANDIFLORA	LARGE-FL. BARBARA'S-BUTTONS		E
PANAX QUINQUEFOLIUS	AMERICAN GINSENG		S-CE
PEDICULARIS LANCEOLATA	SWAMP LOUSEWORT		T
SAXIFRAGA CAREYANA	CAREY'S SAXIFRAGE		S
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD		E
SPIRAEA VIRGINIANA	VIRGINIA SPIRAEA	LT	E
CAREX GRAVIDA	HEAVY SEDGE		S
CAREX OXYLEPIS VAR PUBESCENS	HAIRY SHARP-SCALED SEDGE		S
CYPRIPEDIUM ACAULE	PINK LADY'S-SLIPPER		E-CE
ELODEA NUTTALLII	NUTTALL'S WATERWEED		S
JUNCUS BRACHYCEPHALUS	SMALL-HEADED RUSH		S
LILIUM CANADENSE	CANADA LILY		T

LIST OF RARE AND ENDANGERED SPECIES BY TENNESSEE COUNTY

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
LIPARIS LOESELII	FEN ORCHIS		E
PLATANTHERA FLAVA VAR FLAVA	SOUTHERN REIN-ORCHID		S
PLATANTHERA FLAVA VAR HERBIOLA	TUBERCLED REIN-ORCHID		T
PLATANTHERA PERAMOENA	PURPLE FRINGELESS ORCHID		S
SCIRPUS FLUVIATILIS	RIVER BULRUSH		S
** VERTEBRATES - BIRDS			
ACCIPITER COOPERII	COOPER'S HAWK		D
ACCIPITER STRIATUS	SHARP-SHINNED HAWK		D
AIMOPHILA AESTIVALIS	BACHMAN'S SPARROW		E
BUTEO LINEATUS	RED-SHOULDERED HAWK		
PANDION HALIAETUS	OSPREY		T
THRYOMANES BEWICKII	BEWICK'S WREN		T
** VERTEBRATES - MAMMALS			
FELIS CONCOLOR COUGUAR	EASTERN COUGAR	LE	E
LUTRA CANADENSIS	NORTHERN RIVER OTTER		T
NAPAEOZAPUS INSIGNIS	WOODLAND JUMPING MOUSE		D
SOREX CINEREUS	COMMON SHREW		D
SOREX DISPAR	LONG-TAILED OR ROCK SHREW		D
SOREX FUMEUS	SMOKY SHREW		D
SOREX LONGIROSTRIS	SOUTHEASTERN SHREW		D
SPILOGALE PUTORIUS	EASTERN SPOTTED SKUNK		
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING		D
ZAPUS HUDSONIUS	MEADOW JUMPING MOUSE		D
** VERTEBRATES - REPTILES			
OPHISAURUS ATTENUATUS LONGICAUDUS	EASTERN SLENDER GLASS LIZARD		D
PITUOPHIS MELANOLEUCUS MELANOLEUCUS	NORTHERN PINE SNAKE		T
** VERTEBRATES - AMPHIBIANS			
AMBYSTOMA TALPOIDEUM	MOLE SALAMANDER		D
ANEIDES AENEUS	GREEN SALAMANDER		
CRYPTOBRANCHUS ALLEGANIENSIS	HELLBENDER		D
GYRINOPHILUS PALLEUCUS	TENNESSEE CAVE SALAMANDER		T
HEMIDACTYLIUM SCUTATUM	FOUR-TOED SALAMANDER		D
** VERTEBRATES - FISH			
ANGUILLA ROSTRATA	AMERICAN EEL		
CYPRINELLA MONACHA	SPOTFIN CHUB	LT	E
HEMITREMIA FLAMMEA	FLAME CHUB		D
PHOXINUS TENNESSEENSIS	TENNESSEE DACE		D
POLYODON SPATHULA	PADDLEFISH		

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

March 30, 2000

Reginald G. Reeves, Director
Division of Natural Heritage
State of Tennessee
Department of Environment and Conservation
401 Church Street
Nashville, Tennessee 3243-0443

Dear Mr. Reeves:

INFORMAL CONSULTATION UNDER ENDANGERED SPECIES ACT

The U.S. Department of Energy (DOE) has requested that a pending land purchaser prepare an environmental report for the proposed conveyance of approximately 182 acres of land on DOE's Oak Ridge Reservation. Once DOE receives and reviews this report for adequacy, DOE will accomplish further action to incorporate the report into an Environmental Assessment (EA).

The proposed transfer consists of land comprising the 500-year floodplain that abuts the Boeing property located in Roane County, Tennessee. Oak Ridge Land Company, LLC, proposed to acquire both the 1217-acre Boeing parcel and the 182-acre DOE floodplain parcel in order to develop the land for mixed use. This mixed use will include industrial, commercial, and residential improvements. A map showing DOE's floodplain ownership is enclosed depicting the area. It should be noted that the entire area is affected by a reserved flowage easement in favor of Tennessee Valley Authority (TVA). This reserved easement also prohibits various uses of the land without the express approval of TVA.

In your capacity as the State Natural Heritage Director, DOE is requesting your review of this project pursuant to the coordination requirements of the Endangered Species Act. DOE requests the most recent list of the protected species known at this site. Thank you in advance for your coordination. If you have any questions, please feel free to contact me at 865-576-0938 or Katy Kates at 865-576-0977.

Sincerely,

James L. Elmore
Alternate NEPA Compliance Officer

Enclosure
As stated

cc: Katy Kates, AD-42
Dan Wilken, AD-40
David Allen, SE-32

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Rare Species of Roane County

The following is a list of the rare species found in Roane County. This list was compiled by the Division of Natural Heritage.

- Federal Status Definitions
- State Status Definitions

** ALL PLANTS

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Agalinis auriculata	Earleaved false-foxglove		E
Asplenium scolopendrium var america	Hart's-tongue fern	LT	E
Aster pratensis	Barrens silky aster		T
Aureolaria patula	Spreading false-foxglove		T
Carex gravida	Heavy sedge		S
Carex oxylepis var pubescens	Hairy sharp-scaled sedge		S
Cimicifuga rubifolia	Appalachian bugbane		T
Cypripedium acaule	Pink lady's-slipper		E-CE
Delphinium exaltatum	Tall larkspur		E
Diervilla lonicera	Northern bush-honeysuckle		T
Diervilla sessilifolia var rivulari	Mountain bush-honeysuckle		T
Draba ramosissima	Branching whitlow-grass		S
Elodea nuttallii	Nuttall's waterweed		S
Gnaphalium helleri	Heller's catfoot		S
Hydrastis canadensis	Goldenseal		S-CE
Juglans cinerea	Butternut		T
Juncus brachycephalus	Small-headed rush		S
Leucothoe racemosa	Fetter-bush		T
Liatris cylindracea	Slender blazing-star		T
Lilium canadense	Canada lily		T
Liparis loeselii	Fen orchis		E
Lonicera dioica	Mountain honeysuckle		S
Marshallia grandiflora	Large-fl. barbara's-buttons		E
Panax quinquefolius	American ginseng		S-CE
Pedicularis lanceolata	Swamp lousewort		T
Platanthera flava var flava	Southern rein-orchid		S
Platanthera flava var herbiola	Tubercled rein-orchid		T
Scirpus fluviatilis	River bulrush		S
Solidago ptarmicoides	Prairie goldenrod		E
Spiraea virginiana	Virginia spiraea	LT	E
Thuja occidentalis	Northern white cedar		S

** INVERTEBRATES - MOLLUSC

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Athearnia anthonyi	Anthony's river snail	LE	E
Epioblasma turgidula	Turgid-blossom	LE	E
Fusconaia cuneolus	Fine-rayed pigtoe	LE	E
Fusconaia edgariana	Shiny pigtoe	LE	E
Io fluvialis	Spiny riversnail		
Lampsilis abrupta	Pink mucket	LE	E

Lampsilis virescens	Alabama lamp mussel	LE	E
Lithasia geniculata	Ornate rocksnail		
Plethobasus cooperianus	Orange-foot pimpleback	LE	E
Pleurobema rubrum	Pyramid pigtoe		
Quadrula cylindrica strigillata	Rough rabbitsfoot pearly musse	LE	PE
Villosa perpurpurea	Purple bean	LE	PE

** Other types

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Heron rookery	Heron rookery		

** VERTEBRATES - BIRDS

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Accipiter cooperii	Cooper's hawk		D
Accipiter striatus	Sharp-shinned hawk		D
Aimophila aestivalis	Bachman's sparrow		E
Buteo lineatus	Red-shouldered hawk		
Pandion haliaetus	Osprey		T
Thryomanes bewickii	Bewick's wren		T

** VERTEBRATES - MAMMALS

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Felis concolor couguar	Eastern cougar	LE	E
Lutra canadensis	Northern river otter		T
Napaeozapus insignis	Woodland jumping mouse		D
Sorex cinereus	Common shrew		D
Sorex dispar	Long-tailed or rock shrew		D
Sorex fumeus	Smoky shrew		D
Sorex longirostris	Southeastern shrew		D
Spilogale putorius	Eastern spotted skunk		
Synaptomys cooperi	Southern bog lemming		D
Zapus hudsonius	Meadow jumping mouse		D

** VERTEBRATES - REPTILES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Ophisaurus attenuatus longicaudus	Eastern slender glass lizard		D
Pituophis melanoleucus melanoleucus	Northern pine snake		T

** VERTEBRATES - AMPHIBIANS

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Ambystoma talpoideum	Mole salamander		D
Cryptobranchus alleganiensis	Hellbender		D
Gyrinophilus palleucus	Tennessee cave salamander		T
Hemidactylium scutatum	Four-toed salamander		D

** VERTEBRATES - FISH

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Anguilla rostrata	American eel		
Cyprinella monacha	Spotfin chub	LT	E
Hemitremia flammea	Flame chub		D
Phoxinus tennesseensis	Tennessee dace		D
Polyodon spathula	Paddlefish		

Updated July 24, 2000; Send comments to Department of Environment and Conservation.

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Department of Environment and Conservation
Division of Natural Heritage

Federal Status Definitions of Tennessee's Rare Plants and Animals

Federally listed species are protected by the Endangered Species Act of 1973 (as amended) and the list is administered and determined by the US Fish and Wildlife Service.

E/SA - Endangered by similarity of appearance.

LE - Listed Endangered, the taxon is threatened by extinction throughout all or a significant portion of its range.

LT - Listed Threatened, the taxon is likely to become an endangered species in the foreseeable future.

PE - Proposed Endangered, the taxon is proposed for listing as endangered.

PT - Proposed Threatened, the taxon is proposed to be listed as threatened.

Y - Synonyms

C - Candidate Species, These 'Candidate' species are not currently proposed for listing, but development and publication of proposed rules for such candidate species is anticipated. The US Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species. The US Fish and Wildlife Service will determine the relative listing priority of these candidate species, and encourages other agencies, groups and individuals to give consideration to these taxa in environmental planning.

C2 - DESIGNATION DISCONTINUED

C3 - DESIGNATION DISCONTINUED

3A - DESIGNATION DISCONTINUED

3B - DESIGNATION DISCONTINUED

3C - DESIGNATION DISCONTINUED

__NL - status varies for different populations or parts of range with at least one part not listed.

__XN - non-essential experimental population

__XE - essential experimental population

(Modified From Federal Register, 50 CFR Part 17, Feb. 28, 1996, Vol. 61, No. 40, pp. 7596 - 7613.)

Note: The taxa listed as candidate species may be added to the list of Endangered and Threatened plants and animals, and, as such, consideration should be given them in environmental planning. Taxa listed as LE, LT, PE and PT **must** be given consideration in environmental planning involving federal funds, lands, or permits, and **should** be given consideration in all non-federal activities. For further information contact the Region 4, Endangered Species Coordinator, at the US Fish and Wildlife Service, 1875 Century Boulevard, Atlanta, Georgia 30345, phone (404)679-7096; or an Endangered Species Specialist at the US Fish and Wildlife Service, 446 Neal Street, Cookeville, Tennessee 38501, phone (615)528-6481.

Updated March 1, 1998; Send comments to Department of Environment and Conservation.

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State Status Definitions of Tennessee's Rare Species

Plants

State Status indicates which plants are formally listed as state **Endangered, Threatened,** or **Special Concern** under the authority of the **Tennessee Department of Environment and Conservation.** The Department has the valuable assistance of the State's best field botanists, twelve of whom serve on the Scientific Advisory Committee which periodically reviews the list.

E - Endangered Species means any species or subspecies of plant whose continued existence as a viable component of the state's flora is determined by the Commissioner to be in jeopardy, including but not limited to all species of plants determined to be "endangered species" pursuant to the Endangered Species Act.

PE - Proposed Endangered means any species or subspecies of plant nominated by the Scientific Advisory Committee to be added to the list of Tennessee's Endangered Species. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become Endangered Species.

T - Threatened Species means any species or subspecies of plant which appears likely, within the foreseeable future, to become endangered throughout all or a significant portion of its range in Tennessee, including but not limited to all species of plants determined to be a "threatened species" pursuant to the Endangered Species Act.

S - Special Concern Species means any species or subspecies of plant which is uncommon in Tennessee, or has unique or highly specific habitat requirements or scientific value and therefore requires careful monitoring of its status.

State Status Modifiers follow State Status abbreviations.

P - Possibly Extirpated, species or subspecies that have not

been seen in Tennessee for the past 20 years. May no longer occur in Tennessee.

CE - Commercially Exploited, due to large numbers being taken from the wild and propagation or cultivation insufficient to meet market demand. These plants are of long-term conservation concern, but the Division of Natural Heritage does not recommend they be included in the normal environmental review process.

(Adapted from Somers, Paul. 1989. Revised List of the Rare Plants of Tennessee. Journal of the Tennessee Academy of Sciences, 64(3): 179-184., and Rules of Tennessee Division of Ecological Services, Chap. 0400-6-2, Rare Plant Protection and Conservation Regulations.)

Wildlife

State Status indicates which animals are formally listed as state endangered or threatened under the authority of the Tennessee Wildlife Resources Agency (T.C.A. 70-8-104, 70-8-105, and 70-8-107).

E - Endangered- any species or subspecies of wildlife whose prospects of survival or recruitment within the state are in jeopardy or are likely within the foreseeable future to become so due to any of the following factors:

(a) The destruction, drastic modification, or severe curtailment of its habitat;

(b) Its overutilization for scientific, commercial or sporting purposes;

(c) The effect on it of disease, pollution, or predation;

(d) Other natural or man-made factors affecting its prospects of survival or recruitment within the state; or

(e) Any combination of the foregoing factors.

T- Threatened- any species or subspecies of wildlife which is likely to become an endangered species within the foreseeable future.

D - Deemed in Need of Management- any species or subspecies of nongame wildlife which the executive director of the TWRA believes should be investigated in order to develop information relating to population, distribution, habitat, needs, limiting factors, and other biological and ecological data to determine management measures

necessary for their continued ability to sustain themselves successfully.

Species with no State Status designation are considered rare in the state by the Division of Natural Heritage. Information is collected on these species in order to minimize their formal listing as Endangered or Threatened.

NOTE: For further information contact the Tennessee Wildlife Resources Agency (TWRA) at (615)781-6670, or the Division of Natural Heritage at (615)532-0431. The USFWS has prime responsibility for federal status assignment and enforcement and protection of federally listed species. TWRA has responsibility for state status and enforcement and protection of state listed species.

Updated March 1, 1998; Send comments to Department of Environment and Conservation.

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July 13, 2000

Oak Ridge Properties

Post Office Box 6018
Oak Ridge, Tennessee 37831
865 483 6715
865 482 9639 Fax

Katy Kates, Realty Officer
U.S. Department of Energy
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Kates:

Thank you for your letter dated July 13, 2000 relating to the Department of Energy's floodplain strip that the Oak Ridge Land Company has proposed acquiring as part of an overall package to purchase and develop the Boeing parcel in Roane County, Tennessee.

Your letter asked whether ORLC would be willing to accept transfer of the parcel from the ordinary high water mark landward to the current Boeing boundary line. As we previously stated in our May 26, 2000 meeting with you, your counsel, and your environmental personnel when this possibility was first mentioned, we are willing to accept that particular boundary from DOE if that will resolve some of the concerns that were mentioned. It will also be of interest to our company what the results of your research into whether the land lying between the ordinary low water mark and the ordinary high water mark is to be claimed by DOE or by the State of Tennessee as waters-of-the-state.

Additionally, you had asked in the past for a discussion of the use of the land to be acquired from DOE. As we have stated from the beginning, we are willing to work with DOE in doing whatever will facilitate closure of this action. Because of the reserved flowage easement retained by TVA, we will be using the DOE floodplain parcel (as now delineated) for passive recreational purposes. This will provide the right of the residents' to walk on the land to enjoy the view of the river and the abundant natural habitat. Appropriately, the appraisal itself recognized TVA's restriction on construction of any structures in the floodplain and valued this parcel based on assemblage purposes. Pursuant to the recommendation from the State Historic Preservation Office, there will be minor brush removal to accommodate an aesthetically pleasing natural boundary separation of the exclusionary areas for archaeological sites. Other than this, the habitat will remain in a virtually unchanged state. And as indicated in the draft quitclaim deed prepared by DOE, you have mandated a very strong protection for this habitat with the provision requiring compliance with the Endangered Species Act.

It is our understanding that the environmental assessment will encompass a discussion of possible boat dock development. There are currently no plans for boat docks. In the event that this is considered later, appropriate approvals would be sought from the applicable parties. This would include, but not necessarily be limited to, TVA who holds a reserved flowage easement over the area. The Watts Bar Interagency Working Group task force, and the Corps of Engineers.

I hope the above will satisfy the questions raised as to our use of the land to be acquired from DOE. I am appreciative of the many persons at DOE who have expended considerable amount of time and effort on this project. I thank you and Dan Wilken for your patience and innovative suggestions while working this action. There have been numerous unexpected issues that have arisen in the process and had it not been for you and Dan, we may very well have considered abandoning this project. The encouraging support we have received from DOE, the city, the community, our elected officials, and other parties is indicative of the sincere desire for viable growth in this area.

Yours truly,

Charles Hicks

Charles Hicks
Oak Ridge Land Company

cc: Leah Dever, Manager DOE at ORO
Congressman,Zach Wamp
Federal Office Building
200 Administration Road, Suite 100
Oak Ridge, Tennessee 37830
Dan Wilken, DOE, Assistant Manager for Administration
Robert Poe, DOE, Assistant Manager for Environment, Safety & Quality
Jerry Kuhaida, Mayor, City of Oak Ridge

Tennessee Valley Authority, 2009 Grubb Road, Lenoir City, Tennessee 37771

August 6, 1999

Ms. Katy Kates
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831-8722

Dear Ms. Kates:

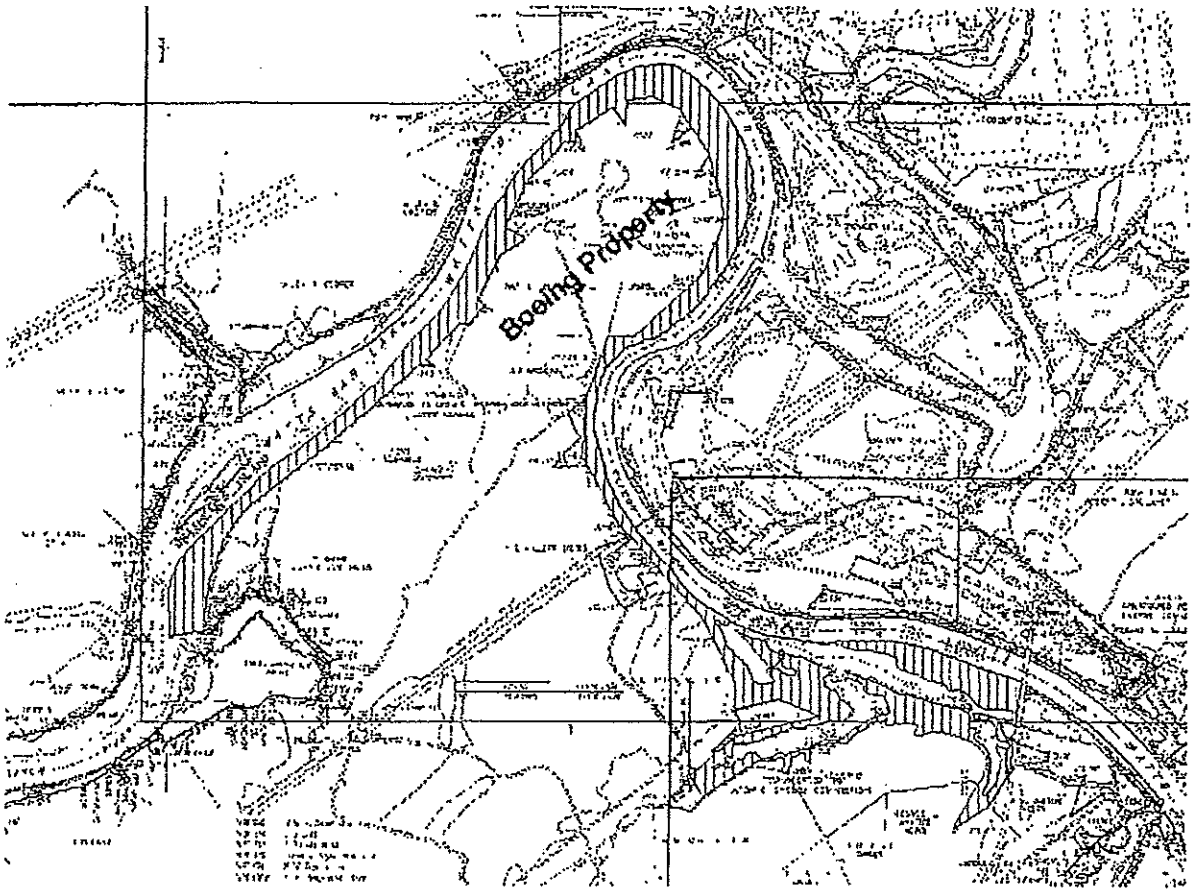
Thank you for meeting with us to discuss our interest in obtaining a reconveyance of certain federal lands on Watts Bar Reservoir. The tract of land that TVA is interested in obtaining is a portion of parcel 4 (approximately 190 acres) that was transferred from TVA to the United States Atomic Energy Commission on January 16, 1959 (see enclosed map). We understand that DOE no longer has a need for this land and is considering its disposal. We request DOE reconvey this parcel to TVA, pursuant to section 7(b) of the TVA Act, 16 USC sec. 831, 831f(b). Even though TVA retains certain landrights across parcel 4, those rights are not sufficient to address impacts to the buffer area, such as vegetation management. A reconveyance would allow TVA to provide shoreline protection of this valued riparian shoreline. If a reconveyance is agreeable to DOE, TVA would be willing to pay the administrative charges associated with the conveyance.

Please let us know if DOE is receptive to this proposal. We look forward to hearing from you and I can be contacted at 423/988-2445.

Sincerely,

Michael R. Crowson, Manager
Melton Hill Watershed Team
Resource Stewardship

Enclosure



Watts Bar Lake

Map References:
D-Stage-56, -57, and -61

Proposed Reconveyance
Approximately 190 Acres

June 16, 1999

n:\wattsbar\w\views\parcel4.apr deb

Watershed
Team

N

Received in Real Estate 7-7-00

Tennessee Valley Authority, Post Office Box 1589, Norris, Tennessee 37828-1589

Ruben O. Hernandez
Vice President
Resource Stewardship

RECEIVED
OFFICE OF THE MANAGER
7/5/00

June 30, 2000

Mr. Jimmy Groton
President, Tennessee Citizens
for Wilderness Planning
130 Tabor Road
Oak Ridge, Tennessee 37830

Dear Mr. Groton:

Thank you for your June 13 letter on behalf of Tennessee Citizens for Wilderness Planning regarding the U.S. Department of Energy's (DOE) proposal to sell land (XTWBR-121) on Watts Bar Reservoir for residential development. Following is background information on this former TVA tract.

When custody of this property was transferred by TVA to the Atomic Energy Commission in 1959, TVA retained specific rights that allow operations by TVA for flood control, maintenance of silt ranges, and review of proposed construction activity related to structures on the transferred property. Our rights and administrative roles are limited to these transfer agreements, flowage easements, and to review responsibilities contained in Section 26a of the *TVA Act*.

Our Record of Decision for the Shoreline Management Initiative Environmental Impact Statement was based on an assumption that property such as this would remain in federal ownership and, therefore, not be available for residential shoreline development. DOE may, however, transfer land and land rights to private ownership. As a result, those tracts can become nonfederal land where TVA may have only flowage easement rights and, consequently, limited authority to influence private water-use facilities or other development.

The Melton Hill Reservoir Land Plan and Environmental Assessment, as noted in your letter, does designate a requirement for mitigation of the loss of public lands in order for TVA to consider residential shoreline alterations through Section 26a. However, the current proposal is on Watts Bar Reservoir. The Watts Bar Reservoir Land Plan has no commitments concerning water access rights associated with DOE properties.

TVA shares your concern about shoreline development. In August of 1999, we requested that DOE convey this tract back to TVA (enclosure: August 6, 1999, letter from Michael R. Crowson to Ms. Katy Kates). We felt a reconveyance would provide TVA with the necessary land rights to protect the shoreline of this valued riparian zone through the Shoreline Management Policy. However, should DOE decide to transfer the tract for residential development, TVA would have to administer our existing land rights over the property and Section 26a of the *TVA Act* the same as any other flowage easement tracts on Watts Bar Reservoir.

For your information, enclosed is a letter (June 12 letter from Eric W. Rauch to Ms. Katy Kates) sent to DOE explaining TVA's preference for future management of the tract.

We appreciate your interest in this matter. If you have additional questions or need further information, Michael R. Crowson, manager of the Melton Hill Watershed Team, will be glad to assist you. His telephone number is (865) 988-2445.

Sincerely,

Ruben O. Hernandez

Ruben O. Hernandez

Enclosures
cc: Ms. Leah Dever (Enclosures)
Manager
Oak Ridge Operations
Department of Energy
200 Administration Road, M-1
Oak Ridge, Tennessee 37830

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

June 16, 2000 Rcvd 6-29-00

Ms. Katy Kates
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831-8722

Dear Ms. Kates:

This is in response to your request for Tennessee Valley Authority (TVA), comments on the proposed sale of 242 acres of former TVA land (Tract No. XTWBR-121) for residential development.

When custody and control of this land was transferred to the Atomic Energy Commission (AEC), TVA retained land rights across XTWBR-121 that allows for operational objectives of TVA such as flooding the property, maintaining silt ranges, and reviewing proposed construction activity relating to structures on the transferred area. Additionally, TVA retained our previously acquired flowage easements on portions of the privately held "Boeing property." We also reserved transmission line easements over the entire transferred tract. Now that title to the transferred property is proposed to pass from the United States to private parties, these retained rights should continue to be reserved to the United States for the use and benefit of TVA. We are enclosing comments from our General Counsel's office that suggest some changes to the draft quitclaim deed to accomplish this. TVA attorney Janice Pulver (423) 751-2096 is available to discuss any questions related to the enclosed comments.

Furthermore, we urge the Department of Energy (DOE) to modify the proposal to ensure consistency with the Shoreline Management Policy (SMP) adopted by the TVA Board of Directors in April 1999. We recommend that shoreline currently undeveloped and in public ownership not be opened up for private residential water-use facilities and that DOE include measures to prevent such development along the shoreline of this tract. As described in our August 6, 1999, letter (Crowson to Kates, copy enclosed), an effective measure to accomplish this would be to transfer the land back to TVA and exclude access rights across it, if any currently exist. Even if this approach is not DOE's preferred alternative, we request this alternative to be included in your National Environmental Policy Act (NEPA) review.

However, should DOE proceed with implementing the action as currently proposed, with the United States retaining certain land rights to the waters edge, TVA would be

in the position of processing applications under Section 26a of the TVA Act from individual lot owners for water-use facilities. We recommend your NEPA review evaluate the impacts of such facilities to limit the amount of analysis required by TVA (at the expense of the applicants) at a later time. Specifically, the current review should consider concerns in connection with contaminated sediments from White Oak Creek and the need for potential dock owners to obtain the approval of the Watts Bar Interagency Working Group. In addition, the impacts of water-use facilities on navigation, wetlands, and National Register-eligible properties should be considered.

To the extent DOE goes forward with an alternative that contemplates water-use facilities, we recommend that the NEPA review consider taking steps to establish shoreline vegetation management zones consistent with those adopted by TVA as part of the SMP.

In addition, we recommend that the attention of the prospective purchasers be called to the fact that the entire tract is subject to easement rights for the construction of TVA transmission lines. As previously noted, these rights were reserved by TVA at the time of the transfer of the property to AEC. Should the purchasers anticipate seeking an abandonment or partial abandonment of these rights, we request that they inform us at this time so this action can also be included in the NEPA review for the sale. Under TVA's normal procedures, such a request would initially be reviewed for consistency with TVA's future transmission facility needs. A recommendation to the TVA Board of Directors to modify or abandon the easement rights would be contingent on agreement of the purchasers to pay for the enhanced value of the land resulting from the abandonment of the easement and of TVA's administrative costs.

Finally, we note that DOE and TVA have agreed that a small portion of the land at the downstream end or the property proposed for sale is, in fact, TVA property. Obviously, that tract cannot be included in the proposed sale.

We look forward to working with you as this effort progresses. Please call Michael R. Crowson, Manager, Melton Hill Watershed Team Office (865) 988-2445, if you have any questions.

Sincerely,

Eric W. Rauch

Eric W. Rauch
Manager, Mideast Region
Resource Stewardship

Enclosures

REVIEW OF QUITCLAIM DEED FROM THE UNITED STATES OF AMERICA BY AND THROUGH THE DEPARTMENT OF ENERGY (DOE) TO OAK RIDGE LAND COMPANY - TENNESSEE VALLEY AUTHORITY TRACT NO. XTWBR-121

Upon review of the above referenced quitclaim deed, TVA advises that the quitclaim deed be revised in accordance with the following comments.

On page 2, section (2) the grantor reserves the right to construct, use, and maintain necessary communication, utility, or access facilities, existing easements for public road, railroads, transmission lines, pipelines, and other public utilities. The deed further states that the use thereof shall not create any unreasonable interference with the use of the land conveyed. The deed should further state that this right is subordinate to and shall in no way interfere with the rights reserved for the use and benefit of the Tennessee Valley Authority (TVA) at page 3, section (4).

The deed at page 3, in section (4), the first line should be revised to state, "There is hereby reserved to the United States of America..." rather than "to the Government" as shown. In the third line "portion" should be deleted. The original reservation with respect to transmission lines in favor of TVA applies to all of the land conveyed by virtue of the transfer document dated January 16, 1959.

The deed at page 4, section (6) and at page 5, section (11) should show that the reversionary right is in favor of the United States of America (USA) for the use and benefit of the U.S. Department of Energy. Since the deed simply states that the reversionary right is in favor of the USA, there could be some confusion as to whether it is for the benefit of TVA or the DOE.

TENNESSEE CITIZENS for WILDERNESS PLANNING

Revision Real Estate 6-21-00

For The Preservation and Enjoyment of Our Wild Lands and Waters

130 Tabor Road
Oak Ridge, Tennessee 37830
Telephone (423) 481-0286

June 13, 2000

Ruben Hernandez
Vice President, Land Management
Tennessee Valley Authority
17 Ridgeway Road
Norris, Tennessee 37828

RECEIVED
OFFICE OF THE MANAGER
6/14/00

Dear Mr. Hernandez:

We have been reading with great interest numerous articles in *The Oak Ridger* and elsewhere concerning plans by the Boeing Corporation and the U.S. Department of Energy (DOE) to sell land in Roane County for residential development along the Clinch River adjacent to DOE's Oak Ridge Reservation. The planned sale to Oak Ridge Properties has been well advertised and widely discussed.

We are surprised and dismayed that the Tennessee Valley Authority (TVA) has not announced clearly that the shoreline of this property is "not available for residential development," according to TVA's Final Environmental Impact Statement (EIS) and Record of Decision for the Shoreline Management Initiative. Clearly, this fact is key information that should be made clear to the public and all parties involved in this proposed action.

Oak Ridge Properties has indicated it intends to purchase this property, and has made public its residential development plans. The U. S. Environmental Protection Agency and the Tennessee Department of Environment and Conservation (TDEC) have required a survey for radioactive contamination of this shoreline. The Oak Ridge City Council recently altered zoning ordinances on the land to allow residential development. And DOE, on May 3, 2000, issued a public "Notice of Involvement" concerning its proposal "to convey to the abutting landowner, an approximate 182-acre parcel of land within the 500-year floodplain of the Clinch River, in Roane County, Tennessee." And still not a word from TVA!

This specific shoreline along the Clinch River is clearly designated in maps in the Draft EIS as TVA-Owned-and-Jointly Managed Shoreline. According to the Record of Decision for the Shoreline Management Initiative, the shoreline in question is therefore not available for development of residential private water use facilities, unless the developer and TVA work out a "maintain and gain" mitigation program.

In TVA's subsequent Finding of No Significant Impact (FONSI) for the Melton Hill Reservoir Land Use Plan (April 20, 1999), the precedent was clearly established that TVA-Owned-and-Jointly Managed Shoreline with DOE is not available for residential development. This FONSI states clearly, "The Department of Energy flowage easement shoreland is not considered to be residential access shoreline."

It is clear from these and other documents that the shoreline in question can not be made available for residential development without a "maintain and gain" mitigation program. This shoreline is especially significant because (1) TDEC's Heritage Program identified several state-listed plants growing there and (2) The Nature Conservancy designated this shoreline as of very high ecological significance.

We call on you to make clear, in both public and private forums, that this shoreline is not available for residential development. More broadly, Tennessee Citizens for Wilderness Planning (TCWP) expects TVA to represent the broad public interest on this issue. Currently, the only voice we hear is from a private, profit-seeking organization that has a powerful bias in favor of development. We need a competent, neutral organization (i.e., TVA) that can balance the broad public and environmental interests against those of the developer.

Sincerely,

Jimmy Groton
TCWP President

cc:
Robert G. Farrell, head of the Melton Hill/Watts Bar watershed office
Kathryn Jackson, Executive Vice President, River System Operations and Environment, Tennessee Valley Authority, 400 W. Summit Hill Drive, Knoxville, TN 37902
Leah Dever, Manager, Oak Ridge Operations, Department of Energy

June 12, 2000

Ms. Katy Kates
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831-8722

Dear Ms. Kates:

This is in response to your request for TVA's comments on the proposed sale of 242 acres of former TVA land (Tract No. XTWBR-121) for residential development.

When custody and control of this land was transferred to the Atomic Energy Commission (AEC), TVA retained rights for flowage easements (land below 750-foot contour) and transmission line easements (entire tract). Now that title to the property is proposed to pass from the United States to private parties, these rights should be reserved to the United States for the use and benefit of TVA. We are enclosing comments from our General Counsel's office that suggest some changes to the draft quitclaim deed to accomplish this. TVA attorney Janice Pulver, 423-751-2096, is available to discuss any questions related to the enclosed comments.

Furthermore, we urge Department of Energy (DOE) to consider modifications to the proposal to ensure consistency with the Shoreline Management Initiative (SMI) adopted by the TVA Board of Directors in April 1999. We believe that shoreline now undeveloped and in public ownership should not be opened up for private residential water use facilities. We recommend that DOE include measures to prevent such development along the shoreline of this tract. One effective measure would be to retransfer the land to TVA and exclude any access rights across it. Even if this approach is not DOE's preferred alternative, we believe this alternative should be included in your National Environmental Policy Act (NEPA) review.

Should, however, DOE proceed with implementing the action as currently proposed and the United States holds nothing but a flowage easement at the waters edge, TVA will be in the position of processing applications under section 26a of the TVA Act from individual lot owners for water use facilities. We recommend that the current NEPA review evaluate the impacts of such facilities to limit the amount of analysis required by TVA (at the expense of the applicants) at a later time. Specifically, we believe the current review should consider concerns in connection with contaminated sediments from Whiteoak Creek and the need for potential dock owners to obtain the approval of the Watts Bar Interagency Working Group. In addition, the impacts of water use facilities on navigation, wetlands, and National Register-eligible properties should be considered.

To the extent DOE goes forward with an alternative that contemplates water use facilities, we recommend that the NEPA review consider taking steps to establish shoreline vegetation management zones consistent with those adopted by TVA as part of SMI.

In addition, we recommend that the attention of the prospective purchasers be called to the fact that the entire DOE tract is subject to easement rights for the construction of transmission lines. As mentioned above, these rights were reserved by TVA at the time of the transfer of the property to AEC. Should the purchasers anticipate seeking an abandonment or partial abandonment of these rights, we would request that they so inform us at this time so that this action can also be included in the NEPA review for the sale. Under TVA's normal procedures such a request would initially be reviewed for consistency with TVA's future transmission facility needs. A recommendation to the TVA Board of Directors to modify or abandon the easement rights would be contingent on the payment of the enhanced value of the land resulting from the abandonment of the easement and of TVA's administrative costs.

Finally, we note that we have agreed that custody and control of a small portion of the land proposed for sale is fact TVAs property. We would appreciate your effort to insure that this land is not included in any sale.

We look forward to working with you. Please call Michael R. Crowson, 865-988-2445, at our Melton Hill Watershed Team Office if you have any questions.

Sincerely,

EWR

Eric W. Rauch
Mideast Regional Manager
Resource Stewardship

Enclosures

Appendix D – Biological Assessment for the Floodplain Strip Adjoining the Boeing Property

A BIOLOGICAL ASSESSMENT FOR THE FEDERALLY ENDANGERED INDIANA BAT (*Myotis sodalis*), WITHIN THE 100 YEAR FLOOD PLAIN OF THE FLOOD PLAIN STRIP ADJACENT TO BOEING PROPERTY, NEAR OAK RIDGE, TENNESSEE

ROANE COUNTY, TENNESSEE

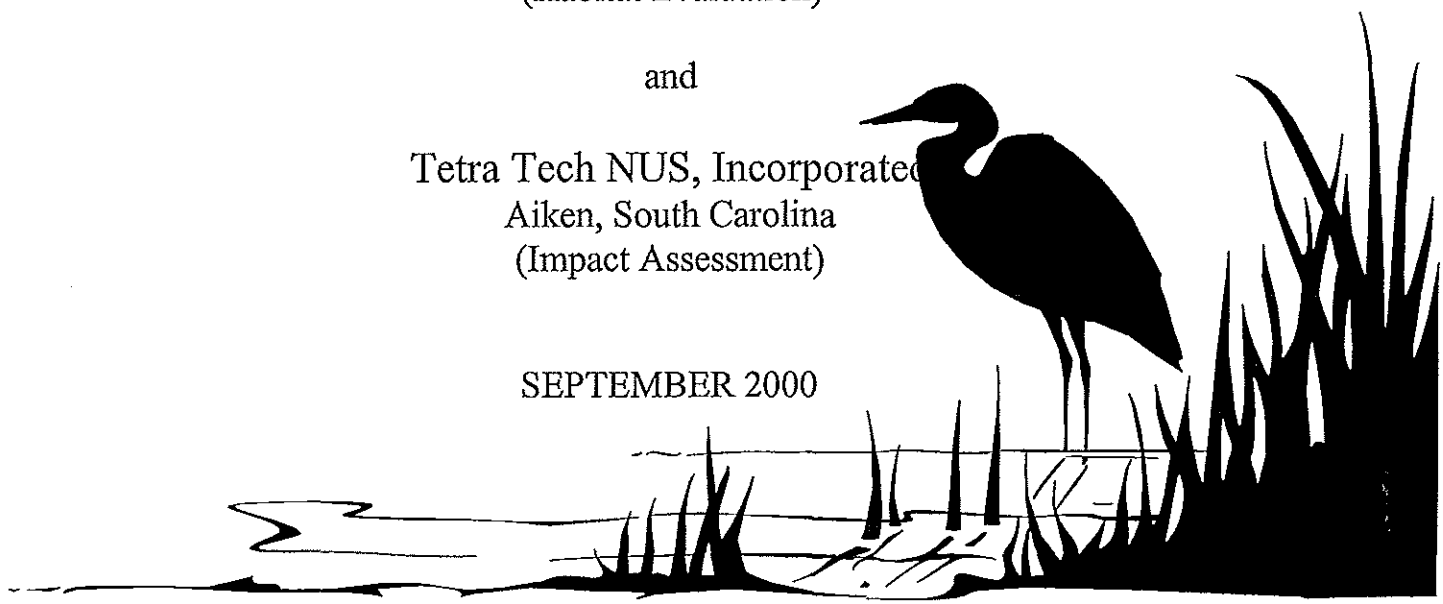
Prepared by:

Shawn M. Cochran
Hal D. Bryan
(Habitat Evaluation)

and

Tetra Tech NUS, Incorporated
Aiken, South Carolina
(Impact Assessment)

SEPTEMBER 2000



I. INTRODUCTION

Eco-Tech, Incorporated was contracted by Tetra Tech NUS, Incorporated to provide a habitat evaluation for the federally endangered Indiana bat, *Myotis sodalis*; along the 100 year flood plain of the Flood Plain Strip Adjacent to Boeing property (Flood Plain Strip), near Oak Ridge, Tennessee. The site borders Watts Bar Lake (Clinch River) in Roane County, Tennessee. The location is depicted on the attached topographic map. The Indiana bat was one of two species of concern mentioned in a letter from the U.S. Fish and Wildlife Service (USFWS) to Department of Energy (DOE) in a letter dated August 8, 2000. The other species mentioned in the USFWS letter, the gray bat (*Myotis grisescens*), was not of concern on the property because this species is an exclusive cave nesting, breeding, and hibernating species. No caves are present on the property. However, suitable caves are present in the Oak Ridge area and the gray bat forages over open water, so potential risks to the gray bat from impacts on surface water are addressed in the Environmental Assessment (EA) for the floodplain strip. In short, no significant impacts to surface water are likely for any alternative including the proposed action and, thus, impacts to the gray bat were concluded to be unlikely.

Study Site

The Flood Plain Strip site is located within the Interior Low Plateau Province of the Ridge and Valley Physiographic region as described in Fenneman 1938. This elevated tableland is the result of a highly resistant rock cap of Pennsylvanian age sandstone and conglomerate that has impeded the erosional process exposing limestone regions to the east and west.

The Cumberland Plateau falls within the Cumberland and Allegheny section of the Mixed Mesophytic Forest region (Braun 1950). This region has one of the oldest and most complex associations of the eastern deciduous forests. Where the region is deeply dissected, typical dominant species include tulip popular, white and red oak, hemlock, basswood, beech, chestnut, and sugar maple.

II. DISTRIBUTION

The Indiana bat's range includes most of the eastern United States. It occurs from Oklahoma, Iowa, and Wisconsin east to Vermont, and south to northwestern Florida (Barbour and Davis 1969). The majority (85%) of the range-wide population hibernates in ten Priority 1 hibernacula (sites that contains more than 30,000 individuals), which are located in Indiana (three sites), Kentucky (four sites), and Missouri (three sites). Some Indiana bats migrate long distances from their hibernacula to find suitable summer habitat to raise offspring. Until recently it was thought that the entire species, with the exception of some males, migrated north and west from their hibernacula to forested areas in Missouri, Indiana, Kentucky, Iowa, Ohio, and Michigan during the summer (Barbour and Davis 1969). This migration pattern is illustrated in Barbour and Davis (1969), with summer band recoveries of both male and female bats banded at Carter Caves, Carter County, Kentucky, from near the Wayne National Forest in southern Ohio. Currently, reproductive Indiana bats have been documented from the following states: Illinois, Indiana, Iowa, Kentucky, Michigan,

Missouri, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, and Virginia.

III. NATURAL HISTORY

Winter Habitat

During the short days of autumn (late August through early October), Indiana bats roost under sloughing bark and in cracks of dead, partially dead, and live trees (Humphrey *et al.* 1977, Gardner *et al.* 1991, J. MacGregor *et al.*, unpublished data). Roost trees used by Indiana bats during the autumn range from 4.7 to 26.4 inches in dbh (diameter at breast height) and occur in forested, semi-forested and open habitats within 1.4 miles of the hibernacula (Kiser and Elliott 1996). Depending on local weather conditions, Indiana bats normally enter the hibernaculum in October and remain there through April (Hall 1962, LaVal and LaVal 1980). Most of the hibernacula with large colonies are located in Missouri, Indiana, Kentucky, Tennessee, and Arkansas (Brady *et al.* 1983).

According to Barbour and Davis (1969), temperature and relative humidity are important factors in the selection of hibernation sites. During the early fall Indiana bats roost in warm sections of caves and move down a temperature gradient as temperatures decrease. In midwinter Indiana bats tend to roost in portions of the cave where temperatures are cool (37° to 43° F). Relative humidity in Indiana bat hibernacula tends to be high, ranging from 66% to 95% (Barbour and Davis 1969). Prior to entering the hibernacula swarming occurs at the entrances (Cope and Humphrey 1977), or sometimes at other caves located near the hibernacula (LaVal *et al.* 1977, J. MacGregor, unpublished data). Swarming usually lasts for several weeks (August - September) and mating occurs toward the end of this period. After mating, females usually enter directly into hibernation, whereas males may remain active through the end of November. Adult females store sperm through the winter thus delaying fertilization until early May. During April and May the majority of the Indiana bat population will leave the cave areas and find suitable summer habitat. Females usually start grouping into larger maternity colonies by mid-May and give birth to a single young between late June and early July (Easterla and Watkins 1969, Humphrey *et al.* 1977).

Summer Habitat

Maternity colonies have been found under sloughing bark of dead and partially dead trees in upland and lowland forest (Cope *et al.* 1974, Humphrey *et al.* 1977, Gardner *et al.* 1991). These colonies are usually located in large-diameter, standing dead trees with direct exposure to sunlight (Callahan *et al.* 1997). A maternity roost may contain more than 100 adult females. During Callahan *et al.*'s (1997) Missouri study, he arranged roost trees into two groups depending on the intensity of use and size of the colony that used each tree. Callahan (1993) classified any tree that was used more than once by greater than 30 bats each time as a primary roost tree, and any tree with less than 30 bats or used only once as an alternate roost tree. The primary roost trees had an average diameter at breast height (dbh) of 22.4 inches, while alternate roost trees had an average dbh of 20.9 inches (Callahan *et al.* 1997). For unknown reasons, Indiana bats require many roost trees to fulfill their needs during the summer (Callahan *et al.* 1997). In Michigan, Kurta and Williams (1992) found that Indiana bats used two to four different roost trees during the course of one season. Although Indiana bats have been found roosting in several different species of trees, it appears that Indiana bats choose roost

trees based on their structural composition. Therefore, it is difficult to determine if one particular species of tree is more important than others. However, twelve tree species have been listed in the Habitat Suitability Index Model (Romme *et al.* 1995) as primary species (class 1 trees). The trees listed by Romme *et al.* (1995) include silver maple (*Acer saccharinum*), shagbark hickory (*Carya ovata*), shellbark hickory (*C. laciniosa*), bitternut hickory (*C. cordiformis*), green ash (*Fraxinus pennsylvanica*), white ash (*F. americana*), eastern cottonwood (*Populus deltoides*), red oak (*Quercus rubra*), post oak (*Q. stellata*), white oak (*Q. alba*) slippery elm (*Ulmus rubra*), and American elm (*Ulmus americana*). In addition to these species Romme *et al.* (1995) listed sugar maple (*A. saccharum*), shingle oak (*Q. imbricaria*), and sassafras (*Sassafras albidum*) as class 2 trees. The class 2 trees are those species believed to be less important, but still have the necessary characteristics to be used as roosts. Trees normally used as primary roosts are typically dead and have a dbh greater than 12 inches (Romme *et al.* 1995). However, in some rare cases primary roosts have been found in large hollow live trees. Kurta *et al.* (1993) found a primary roost in a 22 inch dbh hollow sycamore (*Platanus occidentalis*) in Michigan. Roost trees often provide suitable habitat as maternity roost for only a short period of time. However, bats will use them in consecutive years, if they remain standing and have sloughing bark (Gardner *et al.* 1991, Callahan *et al.* 1997).

Food Habits

Historically, the Indiana bat was thought to prey primarily on moths (Lepidoptera), beetles (Coleoptera), true flies (Diptera), and caddisflies (Trichoptera) (Belwood 1979, Brack 1983, Brack and LaVal 1985). During a study by Belwood (1979), the primary insets consumed by females and juveniles in southern Indiana were Lepidoptera (57%), Diptera (18%), and Coleoptera (9%). Belwood's information was very similar to a three year study conducted by Brack (1983) throughout Indiana. Brack (1983) found that Indiana bats also consumed Lepidoptera (48%), Coleoptera (24%), and Diptera (8.5%). However, he also found Trichoptera (9.8%) to be an important food source. Recent studies by Lee (1993) and Kurta and Whitaker (1998) found the same four insect orders were consumed by Indiana bats in central/northern Indiana and in Michigan. However, these studies showed that Indiana bats preyed much more on caddisflies in central/northern Indiana and in Michigan. The female Indiana bats in central and northern Indiana consumed 40% Lepidoptera, 29% Trichoptera, 13% Coleoptera, and 9% Diptera (Lee 1993). The most recent Indiana bat food habits study was conducted in Michigan at the northern limits of the species range. These bats consumed primarily Trichoptera (55.1%) and Diptera (25.5%) which have aquatic larva (Kurta and Whitaker 1998). These authors hypothesized that Indiana bats in northern portions of their range feed more on aquatic insects than southern populations because they foraged primarily over streams and wetlands.

Indiana bats forage primarily in upland, bottomland, and riparian forests (Cope *et al.* 1974, Humphrey *et al.* 1977, LaVal *et al.* 1977, Belwood 1979), but they will also use forest and cropland edges, fallow fields, and areas of impounded water (Gardner *et al.* 1991). It has been documented that Indiana bats may travel up to three miles from their summer roosts to summer foraging areas and will visit these same areas each night. A pregnant female captured near Morehead, Kentucky maintained a very systematic travel pattern to reach an upland wildlife pond and woods that had been

shelterwood cut (J. MacGregor, unpublished data). This bat arrived at the pond and adjacent woods within a couple of minutes each night that it was tracked. Reproductively active females traveled a maximum mean distance of 1.5 miles from their roost trees to foraging areas in Illinois (Gardner *et al.* 1991). During a recent study by Pruitt *et al.* (1995) at the Jefferson Proving Ground (JPG), Jefferson County, Indiana, reproductive female bats were found to travel a mean distance of 1.7 miles from their original capture sites to their roost trees. Also at JPG, a male traveled 0.4 miles from the capture site to its roost; this distance is less, but similar to the distance of 0.7 miles found by Gardner *et al.* (1991) for males in Illinois.

III. METHODS

No caves, abandoned mines or other potential hibernacula for Indiana bats occur on the property. Thus, the primary concern of this field investigation was to evaluate the site as potential summer habitat for Indiana bats.

Topographic maps, soil maps and aerial photographs were used to plan field activities. The aerial photographs allowed field investigators to determine the location of forested communities, wooded corridors, wetlands and streams. All community types were surveyed on August 29, 2000 by Eco-Tech and David Stair of Tetra Tech, Incorporated, and outlined on an aerial photograph. The potential of these habitats to provide roosting and/or foraging habitat for Indiana bats was rated on a scale of zero to five. The criteria used in this project was modified from Romme *et al.* (1995) by the authors (based on past field experience) to provide a rapid and repeatable habitat assessment. This method was previously used by the authors in Missouri to provide a habitat assessment for Indiana bats (Bryan *et al.* 1997).

Criteria used to rate each plant community as the potential location of Indiana bat **roost trees** was based on five parameters:

1. Presence of snags (dead or dying trees)
2. Trees greater than 40 years old
3. Uneven-aged forest
4. Tree species that have been documented in previous studies as Indiana bat roost trees.
5. Relative proximity to open water and presence of forested corridors to connect the community to water.

For each criteria a community was awarded a single point, therefore a maximum of five and a minimum of zero could be scored. A score of zero means that no resources are available for roosting habitat. A score of one or two represents very poor and poor potential for roost trees, a score of three indicates fair potential for roosting habitat, four denotes a community with good characteristics for roosting habitat, and a score of five is a community with excellent potential for roosting habitat. Areas that received a score of three or greater would be communities most likely to contain Indiana bat roost trees.

Plant communities were also rated for their potential to provide Indiana bat **foraging** habitat. The criteria is similar to that used for roost trees.

1. At least 50% vegetative cover
2. Uneven-aged forest
3. High plant species diversity
4. Tree species that have been documented in previous studies to provide foraging habitat for

Indiana bats.

5. Adjacent to a riparian corridor.

The scoring of each area as foraging habitat was the same as rating communities for roosting habitat. Table 1 presents the results of summing the ratings for potential roosting and foraging habitat for each area.

IV. RESULTS AND DISCUSSION

Introduction

Several plant communities occur on the Flood Plain Strip property. These communities can be located on the attached aerial photograph and are numbered for identification by referring to Table 1. All of the plant communities surveyed provide at least some potential roosting or foraging habitat for Indiana bats. Age, structural diversity and characteristics, and plant species composition are all community parameters that are important in the determination of potential habitat for bat species. Similar habitats are grouped and described below and their potential to provide bat habitat is discussed.

Because of differences in age, structure and proximity to water, not all communities of one kind are rated equal. For example, an extensive mature bottomland forested community may rate a total score of ten, while a less favorable bottomland community may be rated as low as five.

Bottomland Hardwood Forest

This community is one of the two most important potential habitats on the property for foraging and roosting Indiana bats. Approximately 166.23 acres of bottomland hardwood forest occur within the 100 year flood plain of Watts Bar Lake (Clinch River) on the Flood Plain Strip property. Both open water and riparian corridors, usually associated with this community, are important to Indiana bats. Bats use open water to drink and often forage for insects along wooded streambanks. They also travel along forested riparian corridors and use trees as cover from avian predators.

Tree species of these bottomland hardwoods are green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), sycamore (*Plantanus occidentalis*), red (*Acer rubrum*) and silver maples (*A. saccharinum*), box elder (*A. negundo*), slippery (red) elm (*Ulmus rubra*), American elm (*Ulmus americana*), sweetgum (*Liquidambar styraciflua*), honey locust (*Gleditsia triacanthos*), sugarberry (*Celtis laevigata*), and eastern cottonwood (*Populus deltoides*). Most of these tree species have been documented by Romme *et al.* (1995) as Indiana bat roost trees. Many of these tree species are very important for Indiana bat maternity colonies, because when they die, bark peels from the bole of the tree and provides sheltered roosts for bats. There are more dead and dying trees (snags) within bottomland hardwood forest than other community types. Hydrological fluctuations are a primary cause of tree mortality. All bottomland hardwood forests on the property contain numerous snags. An especially high proportion of dead and dying trees, perhaps from recent hydrologic or other disturbances, was noticed in a bottomland hardwood forest (Area 7 on plant community location aerial) along Watts Bar Lake. Virtually all trees in this bottomland hardwood community are dead and/or dying.

Although sufficient forest structure (e.g., uneven-aged community) and maturity of a forest are not restricted to the bottomland hardwood forests of the site, both of these are important forest

characteristics for Indiana bats. Older forest will generally contain more roosting sites (snags), and have a more open understory for foraging bats. Uneven-aged forest are important for Indiana bats, because they provide a stable habitat, a perpetual supply of snags, and a diverse insect assemblage as prey. The ability for a forest to continue to develop snags is crucial, because snags have a short life span and need to be constantly replaced to provide sufficient roost trees. Most of the bottomland hardwood communities rated fair in both roosting and foraging habitat.

Upland Oak-Hickory Forest

Although distinctly different in species composition, mature upland oak-hickory forests on the property are similar to bottomland forest in structural complexity. As a result, they also provide potentially good bat habitat. However, only 2.92 acres of upland oak-hickory forest occurs within the 100 year flood plain. Without connection to upland forest above the 100 year flood plain this narrow band of upland oak-hickory forest will provide only limited, potential Indiana bat foraging and roosting habitat. Overstory species include white oak (*Quercus alba*), Northern red oak (*Q. rubra*), tuliptree (*Liriodendron tulipifera*), shagbark hickory (*Carya ovata*) and black cherry (*Prunus serotina*). The shrub strata are dominated by flowering dogwood (*Cornus florida*), sourwood (*Oxydendrum arboreum*), persimmon (*Diospyros virginiana*), and pawpaw (*Asimina triloba*). Shagbark hickory is one of few species of living trees that are used as Indiana bat maternity roost sites. The exfoliating bark provides an important relatively long term roost for females and nursing bats.

Pine Plantation

A large portion (15.44 acres) of the naturally occurring plant communities on the Flood Plain Strip property have been converted to loblolly pine plantations. Most of these areas were located in the drier sites of the bottomlands. Due to recent hydrological changes and/or infestation from southern pine beetles most of the pine plantations are now dead or dying. A recent study by E. Britzke (personal communication) in North Carolina found that Indiana bats use dying or dead pines as maternity roost sites. However, it is unlikely that these large areas of dead pines support good roosting habitat due to the lack of forest structural diversity and plant species diversity.

Pine plantations were also rated poor for foraging habitat because this monoculture community presumably provides a low diversity of insect prey for Indiana bats, small tree crowns provide little protection for foraging bats, and these areas lack good flight corridors. The only foraging points awarded these areas were for the presence of important tree species and proximity to a riparian corridor.

Emergent Wetland

A single community classified as emergent wetland (0.89 acre) was surveyed on the Flood Plain Strip property. Due to the lack of open water and potential roost trees, this community provides poor foraging and poor roosting habitat.

Roosting Habitat

The only plant community to receive an excellent rating for roosting habitat was the Upland Oak-Hickory forest community (Area 6, approximately 2.92 acres). Three areas (Areas 5, 9,10, approximately 88.34 acres) of bottomland hard wood forest received a score of three, for fair potential roosting habitat. The remaining six areas (Bottomland Hardwood Forest Areas 1,2,7,8, approximately 77.89 acres; Pine Plantation Area 3, approximately 15.44 acres; Emergent Wetland Area 4, approximately 0.89 acre) were considered to provide poor roosting habitat.

Foraging Habitat

Only the Upland Oak-Hickory forest community (Area 6) rated excellent for foraging habitat. Six areas of bottomland hardwood forest (Areas 1,2,5,9,10, approximately 130.98 acres) received a score of a three, for fair potential Indiana bat foraging habitat. The remaining four areas (Pine Plantation Area 3, Emergent Wetland Area 4, Bottomland Hardwood Areas 7 and 8) are considered to provide poor Indiana bat foraging habitat.

Table1 presents the results of field investigations and ratings for each community as potential Indiana bat roosting and foraging habitat.

V. SUMMARY/POTENTIAL IMPACTS AND MITIGATION

There are no caves or mines on the property that could provide hibernacula for Indiana bats (or roosting habitat for gray bats). However, there is potential roosting and foraging habitat for Indiana bats on the Flood Plain Strip property. Several plant communities were evaluated for their potential to provide summer habitat for Indiana bats. The most important communities are upland and bottomland mature forests.

Although unlikely, a maternity colony, an adult male colony, or individual Indiana bats could use roosting habitat located on the floodplain strip. Any potential adverse impacts to the Indiana bat could be eliminated by not conducting the limited felling of trees (an activity associated with the proposed action in the EA) during the summer roosting season from May to September. Such actions would prevent the loss of any bats that might otherwise be using the trees for roosting or rearing young. Although the proposed action in the EA might encompass limited felling of trees that are suitable and potentially suitable for roosting, there are adequate numbers of suitable and potentially suitable roosting trees on the floodplain strip. Any limited vegetation clearing or placing of trails could be conducted in areas without potential for excellent habitat as well, such as the three-acre portion of the property rated as "excellent" habitat. Overall, it is concluded that the transfer and subsequent development of the flood plain strip is unlikely to adversely impact the Indiana bat.

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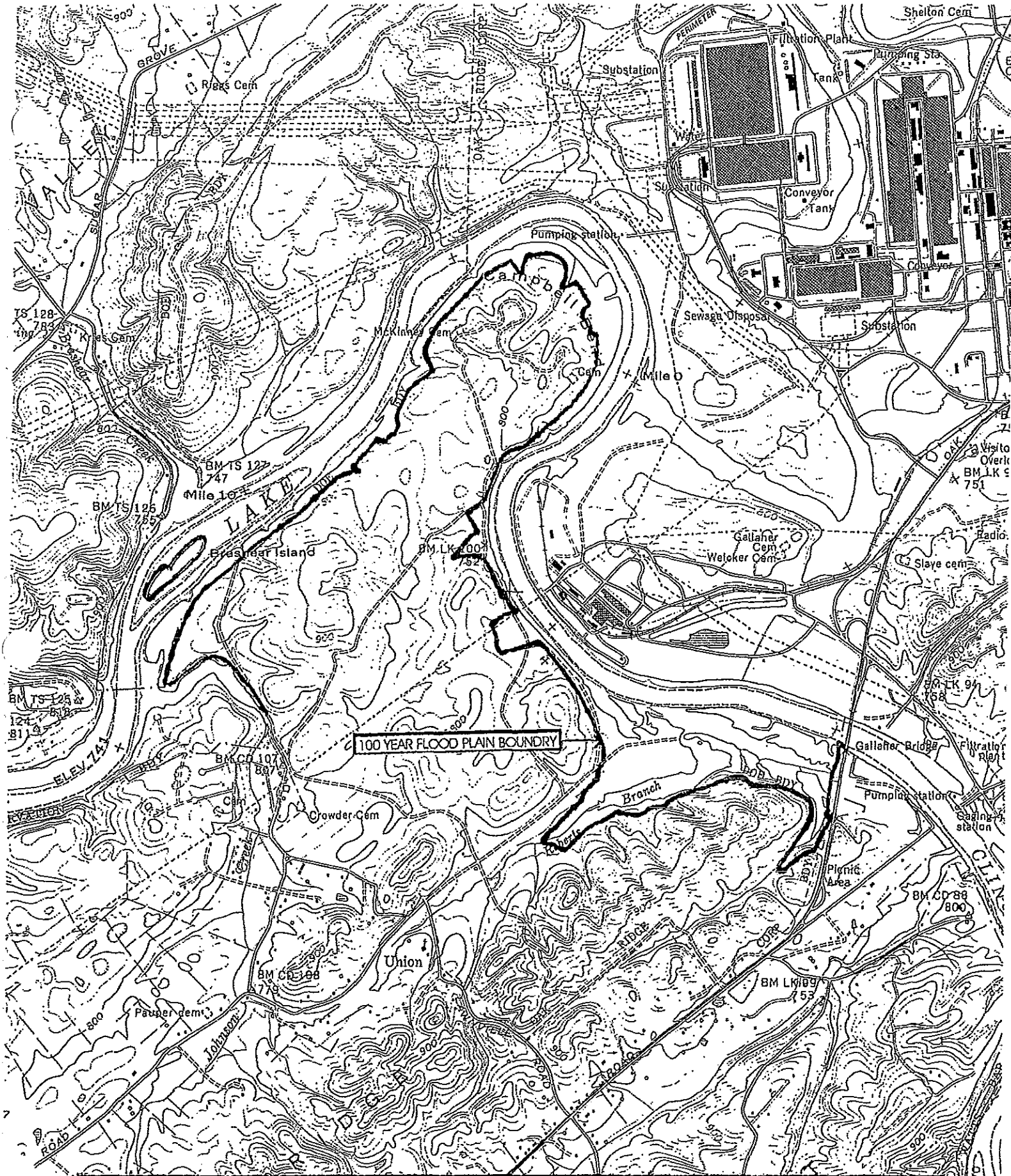
Table 1. Evaluation of potential roosting and foraging habitat for the Indiana bat, within the 100 year flood plain of the Flood Plain Strip Adjacent to Boeing Property, near Oak Ridge, Tennessee. August 29, 2000.

AREA	COMMUNITY TYPE	TOTAL ACRES OF PLANT COMMUNITY	ROOST TREE SCORES	FORAGING HABITAT SCORES
1	Bottomland Hardwood Forest	16.28	2	3
2	Bottomland Hardwood Forest	26.36	2	3
3	Pine Plantation	15.44	2	2
4	Emergent Wetland	0.89	1	2
5	Bottomland Hardwood Forest	51.10	3	3
6	Upland Oak-Hickory Forest	2.92	5	5
7	Bottomland Hardwood Forest	25.46	2	2
8	Bottomland Hardwood Forest	9.79	2	2
9	Bottomland Hardwood Forest	5.13	3	3
10	Bottomland Hardwood Forest	32.11	3	3



PROJECT LOCATION MAP

AN EVALUATION OF POTENTIAL HABITAT FOR THE FEDERALLY ENDANGERED INDIANA BAT (*Myotis sodalis*), WITHIN THE 100 YEAR FLOOD PLAIN OF THE FLOOD PLAIN STRIP ADJACENT TO BOEING PROPERTY, NEAR OAK RIDGE, TENNESSEE

Roane County, Tennessee

U.S.G.S. Elverton, Tennessee Topographic Quadrangle

ECO-TECH, INC.

ECO-SOUTH, INC.

Appendix E – Agency and Public Comments and DOE Responses

APPENDIX E. AGENCY AND PUBLIC COMMENTS AND DOE RESPONSES

This appendix describes the comments received by the U.S. Department of Energy (DOE) from the stakeholders of the Oak Ridge Reservation (ORR) on the draft Environmental Assessment for the Floodplain Strip Adjoining the Boeing Property (DOE/EADRE-006). This appendix also presents responses to summary comments provided to DOE on the EA. DOE held a public comment meeting on November 14, 2000, which was announced in the local media prior to that date. At that meeting DOE encouraged stakeholders to provide verbal comments as well as written comments that could be submitted on DOE-provided notecards. In addition, DOE established several other methods for submitting comments on the EA, including via facsimile, telephone, and e-mail.

During the public comment period DOE received the following:

- Five comment letters from State and Federal regulatory agencies
- One letter from the Mayor of the City of Oak Ridge
- Two letters from private environmental organizations
- One letter from the ORR Local Oversight Committee (LOC)
- Forty-one public comments submitted via notecard and e-mail
- One letter from the Oak Ridge Chamber of Commerce

DOE reviewed and categorized the individual comments. The comments fell into one of six categories:

- Comments regarding Tennessee Valley Authority (TVA) involvement in the Floodplain EA process.
- Comments regarding the implications of "unrestricted use" of the floodplain strip as part of the Proposed Action
- Comments related to the presence of State of Tennessee threatened and endangered species on the property.
- Comments regarding the analysis of cumulative impacts.
- Comments regarding the potential impacts on floodplain strip wetlands.
- Miscellaneous comments.

The following paragraphs discuss the summarized comments and provide DOE's responses to them. Copies of the complete list of individual comment letters and comments are available in the DOE reading rooms.

Comments regarding TVA involvement in the Floodplain Strip EA process:

Several comments addressed the issue of TVA involvement in the EA process, generally questioning the extent of TVA involvement. Other comments were about conveyance of the floodplain strip to TVA (Alternative 2) and concern over future TVA involvement in potential improvements on the property by a new owner.

DOE Response:

DOE has solicited and welcomed input and contributions to the proposed land conveyance from TVA prior to and throughout the EA process. In June 2000, TVA requested that an alternative be added to the EA that addressed potential conveyance of the property to TVA. TVA also requested that certain technical analyses be incorporated into the EA, and this request was honored. TVA stated that the agency would be in the position of processing applications under Section 26(a) of the TVA Act from individual lot owners for water-use facilities if the Proposed Action of conveyance to the abutting landowner were carried out.

As such, on August 31, 2000, the potential new landowner requested a letter from TVA addressing TVA's position on the issuance of shoreline facility permits across the floodplain strip. TVA agreed to process dock applications if (1) the access rights across the remaining DOE property are deeded rights, and (2) a shoreline management plan was submitted to TVA for approval. TVA reiterated this position in a letter of comments dated November 30, 2000 on the draft EA, at which time TVA indicated that the agency would consider the Proposed Action if TVA's requests were met. Thus, any future development on the floodplain strip shoreline will be subject to TVA review and approval in accordance with TVA's Section 26(a) permitting process.

Comments regarding the potential "unrestricted use" of the floodplain strip as part of the Proposed Action:

Several comments expressed concern over potential ambiguity of the term "unrestricted use" of the floodplain strip by the proposed new owner, and the implications of unrestricted use on the floodplain strip resources.

DOE Response:

The term "unrestricted use" was used in the context of the Proposed Action to avoid unreasonable encumbrances for the potential, future landowner. That is, the term is intended to provide flexibility in the potential improvements to the floodplain strip that a future landowner might choose to implement. This term and its intended meaning will be added to the glossary in the EA. However, as discussed in detail in the EA, the current intention of the proposed landowner is to conduct limited improvements on the floodplain strip, leaving the 182 acres largely in its current state. The EA can only address improvements that are currently proposed at this time; it cannot speculate about an infinite number of potential, intensive development scenarios that are not planned by the proposed new owner.

Comments regarding the potential presence of State-listed threatened and endangered species on the floodplain strip.

Several comments expressed concern over possible impacts to State-listed threatened and endangered species on the floodplain strip. Although some comments mentioned concern about State-listed species of animals, the related comments focused mainly on State-listed plant species. Concerns were raised as to why a survey of the 182 acres for State-listed plants had not been conducted.

DOE Response:

The Endangered Species Act (ESA) of 1973, as amended, applies only to Federally threatened and endangered species. To satisfy informal consultation requirements of Section 7 of the ESA, DOE corresponded with the U.S. Fish and Wildlife Service (USFWS) to determine if conveyance of the floodplain strip from Federal control would jeopardize any Federally threatened or endangered species. USFWS indicated concern over the Federally-endangered gray bat and Indiana bat. Therefore, in accordance with written expectations and informal discussions with USFWS, DOE conducted a biological assessment to determine the extent and quality of endangered bat habitat on the floodplain strip. The EA determined that minimal impacts to these species of Federally threatened bats were likely due to the proposed conveyance (Appendix B).

Despite the limitations of the ESA to Federally-listed species, DOE also contacted the Tennessee Department of Environment and Conservation (TDEC) to determine if conveyance of the property would affect State-listed species. TDEC indicated that 4 State-listed animals (none were

Federally-listed) could be present within a one-mile radius of the site. TDEC indicated also that seven state-listed plants (none were Federally-listed) could be found on the property. TDEC suggested a survey for these species, but did not require one. DOE contacted The Nature Conservancy (TNC), who have conducted biological surveys on ORR, to determine if TNC had any records of the State-listed plants on the floodplain strip. TNC provided reports but it could not be determined from their database the exact locations of State threatened and endangered species occurrences on the floodplain strip. Thus, a mitigation measure discussed in the EA was that the future owner could conduct a State-listed plant survey in those specific areas of planned improvements. This would be preferable to a survey of the entire 182 acres due to the difficult nature of the terrain and the very limited areas of planned improvements. In addition, TVA stated in an August 31, 2000 letter that the future owner would be required to submit a shoreline management plan for TVA approval, part of which would include a vegetation management plan.

Comments regarding the analysis of cumulative impacts.

Several comments expressed concern over the level of cumulative impact analysis, analysis of both floodplain and Boeing Property impacts, in the draft EA.

DOE response:

The draft EA addressed potential impacts on the floodplain strip as part of each alternative as direct impacts, and indirect impacts as those potential impacts from development on the abutting Boeing Property. Section 4.9 then coalesced direct and indirect impacts into a cumulative impact analysis. Because the cumulative impacts as a result of the Proposed Action were determined to be generally negligible and of short-term duration in all resource areas, the level of cumulative impact analysis was deemed appropriate. However, additional discussion of cumulative impacts will be added, where appropriate, to Section 4.9.

Comments regarding the potential impacts on floodplain strip wetlands.

Several comments addressed the potential impacts to wetlands on the floodplain strip after their removal from Federal control as part of the Proposed Action.

DOE Response:

Although the 69 acres of wetlands would be relinquished from Federal control as part of the Proposed Action, several regulations for floodplain management and wetlands protection would still apply. As discussed in Section 5.1, these include:

- 10 CFR 320-330, Department of Army Wetlands Construction Restrictions
- 10 CFR 1022, Department of Energy Compliance with Floodplain/Wetlands Review Requirements
- Executive Order 11990, Protection of Wetlands
- Executive Order 11988, Floodplain Management

Also, the conveyance document would appropriately address compliance with the requirements listed above. In addition, proposed improvements, which are generally limited in scope, would be part of any shoreline management plan that was presented to TVA, and the subject to Shoreline Management Initiative (SMI) processes.

Miscellaneous comments:

The following section discusses public and agency comments that, although not pervasive throughout the entire list of comments received, were deemed by DOE to be of significant policy or technical importance.

Comment 1:

One comment stated that the draft EA should have focused more on the potential impacts on the floodplain strip in the affected environment section, rather than having a concomitant discussion of the Boeing Property. Concern was raised that this distracted from the assessment of environmental impacts.

DOE Response:

The draft EA specifically and separately discussed the attributes of floodplain strip and Boeing Property for each resource area. Emphasis was placed on the affected environment of the floodplain strip, resulting in a much smaller discussion of the Boeing Property. Because the assessment of direct and indirect impacts in the environmental consequences section was most appropriate, it was deemed necessary to provide a discussion of the environmental setting as a

whole in the affected environment section. This also provided a context for the discussion of cumulative impacts in Section 4.9.

Comment 2:
One comment stated that groundwater restrictions should be utilized until an evaluation is completed concerning potential contaminated groundwater entering beneath the Boeing Property via conduit flow under the Clinch River from ETTP at present or in the future.

DOE response:

Groundwater restrictions are currently in effect and even though DOE and EPA have determined that the groundwater is uncontaminated, restrictions prohibiting its use will be placed within the quitclaim deed. There are no current plans to continue groundwater monitoring on the floodplain strip.

Comment 3:
One comment suggested that the EA address air quality on the floodplain strip proper based on ETTP's Independent Investigation findings related to air emissions associated with the Toxic Substances Control Act (TSCA).

DOE Response:

Although the data from ETTP mentioned in the comment could be of some use, the data used in the EA are considered to be as representative of potential exposure as any data available. As stated in the EA, the maximally exposed individual in the Oak Ridge area is located about 8.1 miles east-northeast of the stack at ETTP. This is most likely to be due, among other factors, to prevailing winds and wind dispersion. This exposure results in approximately 0.004 percent of the 264,000 person-rem that this population could have received from natural sources. As a result, it is unlikely that the use of other air quality data from ETTP would change the conclusion of negligible air impacts on the floodplain strip.

Comment 4:
A few comments expressed concern about how archaeological sites would be protected from potential impacts under the Proposed Action. Another comment questioned the omission of the archaeological sites eligible for the National Register of Historic Places from the EA maps.

DOE Response:

The archaeological sites will be excluded from the conveyance. Further, pursuant to a request from the State of Tennessee, those sites were excluded from the EA maps in order to avoid potential vandalism, damage, and/or unauthorized collection of materials from those sites.

Comment 5:

A few comments suggested that DOE or TVA should retain environmentally sensitive areas on the floodplain strip if the property is conveyed to a private party, and evidenced concern over removal of the parcel from the National Environmental Research Park (NERP). It was suggested also that a "hybrid" alternative be incorporated into the EA that encompasses the Proposed Action but leaves the environmentally sensitive areas under DOE or TVA ownership.

DOE Response:

For the most part, all floodplains and wetlands on the floodplain strip can be considered environmentally sensitive areas, including all 69 acres of wetlands. These wetlands are found on several portions of the floodplain strip and in many instances they are of somewhat amorphous nature. Therefore, difficulties would arise in trying to apportion the exact areas that DOE or TVA would retain ownership over. More importantly, the proposed improvements on the floodplain strip under the Proposed Action are limited in scope and, as determined in the EA, would have minimal impacts on the broader ecology of environmentally sensitive areas.

Comment 6:

One comment stated that DOE should perform NEPA documentation on the sale or release of Federal lands as a whole, as opposed to constructing individual reports for each parcel that is conveyed.

DOE Response:

DOE, as a Federal agency, is required to abide by NEPA regulations for all actions affecting the sale or release of Federal (DOE) lands.

Comment 7:

A comment was submitted regarding the DOE surface water monitoring data near the floodplain strip (presented on pages 20 and 21 of the draft EA), as follows:

"The sum of the radionuclide results for all five of the surface water monitoring stations, including Stations K-716 and K-901-A (Table 2) remained below the annual limit as required by DOE Order 5400-6." The first part of this sentence implies that the sum of fraction is calculated for all five stations. When in fact, the sum of fractions is calculated and reported for each of the five stations and each sum must remain below the annual limit as required by the DOE Order. Secondly, there is no DOE Order 5400.6. The reference should be DOE Order 5400.5 – Radiation Protection of the Public and the Environment.

DOE Response:

To begin with, the text will be corrected to reference DOE Order 5400.5. The text will be changed to state that the sum of the radionuclide concentrations for each of the five surface water stations...remained below the annual limit...," which is accurate and consistent with the data presentation.

Comment 8:

One comment stated that the socioeconomic benefits of the Proposed Action were overestimated, stating that these benefits would likely be offset by an increase in demand for public services.

DOE Response:

DOE believes that the assessment of socioeconomic impacts in the draft EA reflects an accurate, balanced evaluation. The EA states that the conveyance of the property would likely not directly influence the in-migration of new residents or influence the tax base, and acknowledges a potential increase in demand for public services if in-migration were to increase. However, the Boeing Property and floodplain strip are located in an area of Oak Ridge slated for future growth and investment on the Boeing Property could far exceed the increased cost of services.

Appendix F – Provisions to be addressed within the Conveyance Document

1. Subject to flowage and other rights to Tennessee Valley Authority (TVA) as reserved in transfer agreement between TVA and the GRANTOR'S predecessor agency, Atomic Energy Commission, dated January 16, 1959. All such reserved rights containing conditions, limitations, exceptions and reservations are transferred to the GRANTEE herein as follows:

A. With respect to the transfer of lands located below the 750-foot contour level on the Clinch River, TVA may:

(1). Cover all or any part of said land with water at any time in the operation of Watts Bar Dam, or from the erection and/or operation of any other structures across the Clinch River;

(2). Enter upon said lands, from time to time, and clear, destroy, or dispose of any timber, or other natural growth, and any structures, accumulations, trash, filth, or any other thing which in the sole judgment of TVA would in any way interfere with navigation or flood control or the production or transmission of electric power and energy, or tend to render inaccessible, unsafe or unsanitary either the waters of the Clinch River or the Watts Bar Lake or the margin thereof;

(3). Enter upon said lands and clear, ditch, dredge, and drain, and apply larvicides and chemicals thereon, and carry on bank protection and other work, as in the discretion of TVA may be necessary or desirable in carrying out an adequate program of mosquito control;

(4). Enter upon said lands and excavate, clear, erect structures and do such other things as is necessary and desirable in connection with the needs of navigation, and;

(5). Maintain any existing boundary and transfer lines and silt range stations upon said land.

B. Unless otherwise approved by TVA, additional buildings or structures will not be constructed or maintained, except for fences or except for water use facilities constructed in accordance with plans approved by TVA in writing prior to construction, on any portion of the lands described in Item A. above.

C. TVA shall not be liable for any loss or damage to the lands or to any improvements located thereon due to erosion or soakage of the lands as a result of wave action, fluctuation of water levels, or other causes.

2. There is hereby reserved to the Government a permanent easement and right-of-way for an existing powerline over the area shown on attached Exhibit "A" for the use, control, and benefit of the Tennessee Valley Authority (TVA) in, upon, over, and/or across a portion of the land conveyed to enter the said right-of-way at any time and from time to time and to erect, maintain, repair, rebuild, operate and patrol transmission line structures, with sufficient wires and cables for electrical power circuits and communications circuits and all necessary appurtenances in, on, over and across said right-of-way; to clear said right-of-way and keep the same clear of all trees, brush, buildings, and fire hazards; to prevent the drilling or sinking of wells within the right-of-way; and to remove any trees located beyond the limits of the right-of-way which in falling would come within 10 feet of any transmission line structure or conductor; together with the right of ingress and egress to said right-of-way over the adjoining property.

3. The GRANTOR acknowledges that the Oak Ridge Reservation has been identified as a National Priority List Site under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA). The GRANTEE acknowledges that the GRANTOR has provided it with a copy of the Oak Ridge Reservation Federal Facility Agreement (FFA) and relevant amendments entered into by the United States Environmental Protection Agency Region 4, the Tennessee Department of Environment and Conservation, and the GRANTOR, effective on January 1, 1992. The GRANTEE agrees that should any conflict arise between the terms of such agreement as it presently exists or may be amended and terms of this deed, the terms of the FFA will take precedence. Further, pursuant to CERCLA Section 120(h)(4)(D), the GRANTOR warrants that any response action or corrective action found to be necessary after the date of this conveyance shall be conducted by

the GRANTOR. The GRANTEE hereby grants to the GRANTOR a right of access to the property in any case which a response action or corrective action is found to be necessary or such access is necessary to carry out a response action or corrective action on adjoining property. If the property subject to the conveyance is removed from the National Priority List under CERCLA, and the Environmental Protection Agency and the Tennessee Department of Environment and Conservation agree in writing that the property subject to the conveyance may be released from the terms of this condition, this condition shall no longer apply.

4. The land herein conveyed shall be used in a manner consistent with the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.).

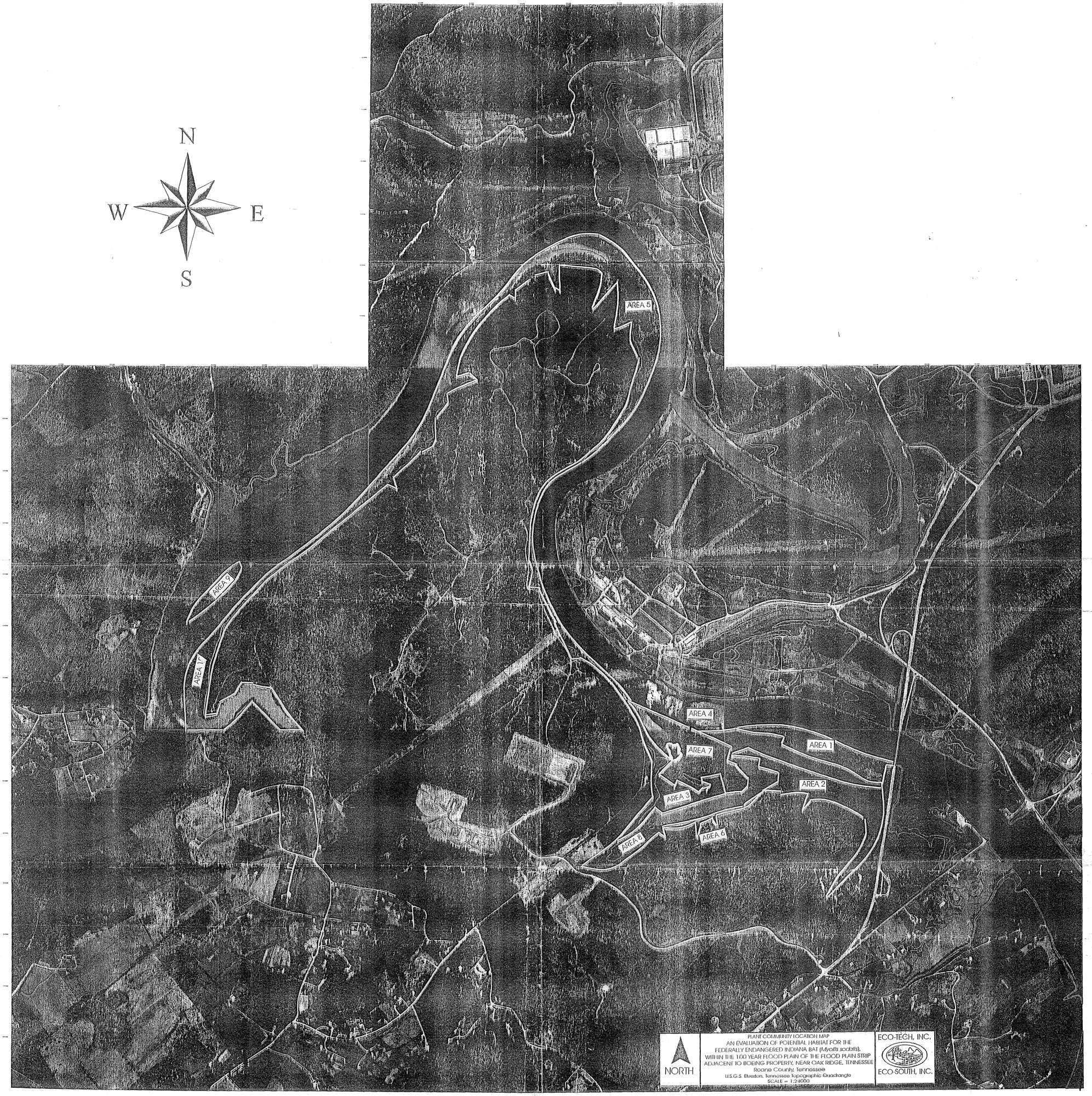
5. The GRANTEE, its successors and assigns, shall comply with all applicable Federal, State, and local laws and regulations with respect to any present or future development of the property herein conveyed, including, but not limited to, those laws and regulations which govern sewage disposal, facilities, water supply, and other public health requirements. All structures, facilities, and improvements requiring a water supply shall be required to be connected to the GRANTEE'S approved water system for any and all usage. Said restriction prohibits the use of any groundwater source.

6. All construction within any 100-year floodplain and all construction within any floodway must comply with applicable Federal and State laws with respect to said construction.

7. If any portion of the land herein conveyed is deemed to be jurisdictional wetlands as determined by the Nashville District Corps of Engineers, any development thereon must comply with the Department of Army Wetlands Construction Restrictions contained in 33 CFR, Sections 320 through 330, as amended, and any other applicable Federal, State, or local wetlands regulations.

8. The GRANTEE, its successors and assigns, shall fence and protect any existing cemeteries that may be located on the property herein conveyed and said cemeteries shall

remain in their same location as a separate land unit. GRANTEE shall also provide perpetual public ingress and egress to any such cemeteries.



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