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**§ 1304.208 Shoreline stabilization on TVA-owned residential access shoreland**
TVA may issue permits allowing adjacent residential landowners to stabilize eroding shorelines on TVA-owned residential access shoreland. TVA will determine if shoreline erosion is sufficient to approve the proposed stabilization treatment.

**(a)** Biostabilization of eroded shorelines.
(1) Moderate contouring of the bank may be allowed to provide conditions suitable for planting of vegetation.
(2) Tightly bound bundles of coconut fiber, logs, or other natural materials may be placed at the base of the eroded site to deflect waves.
(3) Willow stakes and bundles and live cuttings of suitable native plant materials may be planted along the surface of the eroded area.
(4) Native vegetation may be planted within the shoreline management zone to help minimize further erosion.
(5) Riprap may be allowed along the base of the eroded area to prevent further undercutting of the bank.

**(b)** Use of gabions and riprap to stabilize eroded shorelines.
(1) The riprap material must be quarry-run stone, natural stone, or other material approved by TVA.
(2) Rubber tires, concrete rubble, or other debris salvaged from construction sites shall not be used to stabilize shorelines.
(3) Gabions (rock wrapped with wire mesh) that are commercially manufactured for erosion control may be used.
(4) Riprap material must be placed so as to follow the existing contour of the bank.
(5) Site preparation must be limited to the work necessary to obtain adequate slope and stability of the riprap material.

**(c)** Use of retaining walls for shoreline stabilization.
(1) Retaining walls shall be allowed only where the erosion process is severe and TVA determines that a retaining wall is the most effective erosion control option or where the proposed wall would connect to an existing TVA-approved wall on the lot or to an adjacent owner's TVA-approved wall.
(2) The retaining wall must be constructed of stone, concrete blocks, poured concrete, gabions, or other materials acceptable to TVA. Railroad ties, rubber tires, broken concrete (unless determined by TVA to be of adequate size and integrity), brick, creosote timbers, and asphalt are not allowed.
(3) Reclamation of land that has been lost to erosion is not allowed.
(4) The base of the retaining wall shall not be located more than an average of two horizontal feet lakeward of the existing full summer pool water. Riprap shall be placed at least two feet in depth along the footer of the retaining wall to deflect wave action and reduce undercutting that could eventually damage the retaining wall.

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## 3.1.11 Wetlands

Wetlands occur along the 12.5 miles of shoreline fronting the Bellefonte tract. Figure 3.1.5-1 illustrates the wetlands located near the plant site. Included are 22 acres of islands along the old river channel, classified as Palustrine, bottomland hardwood, deciduous, temporarily flooded according to the Cowardin classification system. [87] These islands are separated from the mainland by aquatic bed wetlands, which are classified as Lacustrine, aquatic bed, rooted vascular submerged permanently flooded. [88] Fringe wetlands are characterized by the presence of emergent and scrub-shrub plant communities and forested shoreline. These are shallow overbank areas adjacent to the old river channel, lying within the lake fluctuation zone and extending upgradient on the shoreline to elevation 597 ft above msl. Aquatic bed wetlands are found between 590 and 595.44 feet msl. The fringe wetlands include such plant species as:

Common cattail (*Typha latiflolia*),
Giant cutgrass (*Zizaniopsis miliacae*),
Bulrush (*Scirpus americanus*),
Soft rush (*Juncus effussus*),
Button bush (*Cephalanthus occidentalis*),
Black willow (*Salix nigra*),
River birch (*Betula nigra*),
Sycamore (*Platunus occidentalis*),
Willow oak (*Quercus phellos*),
Water oak (*Quercus nigra*), and
Red maple (*Acer rubra*).

Aquatic bed wetlands are formed by floating mats of Eurasian milfoil (*Myriophyllum heterophyllum*), American pondweed (*Potamogeten pectinatus*), and spiny-leafed naid (*Najas minor*).

The higher forested portion of the fringe wetlands is considered to be wetlands under the Hydrogeomorphic classification system developed by Brinson but not under the 1987 U. S. Army Corps of Engineers Wetlands Delineation Manual. [88] TVA fulfills its mandate to protect wetlands as directed by Executive Order 11990 by utilizing the Cowardin, Brinson, and the Corps classification systems. [89] Mitigation for wetlands unavoidably impacted is required under Section 404 of the Clean Water Act only for lands qualifying as wetlands according to the U. S. Army Corps of Engineers 1987 Manual. This would include the aquatic beds, islands, and emergent-scrub/shrub area.

Three ponds were constructed at Bellefonte during previous construction activities in which wetland communities have developed. The dikes of two ponds were breached in 1989, and six acres of Palustine, emergent, persistent, intermittently flooded wetlands have developed. The third pond, (12 acres), used to filter storm water runoff, is classified as Palustrine, scrub-shrub, permanently-flooded wetland.

05 May, 2006

**Request # 10389 – Bellefonte NP – Wetlands Site Visit: Wetland Input**

Combined office review and ground surveys were conducted for the project area between the Bellefonte parking lot and the perimeter road around the north side of the site. The office review included a review of TVA Natural Heritage data, National Wetlands Inventory data, aerial photographs supplied by TVA Nuclear, Natural Resources Conservation Service (Soil Conservation Service) soil survey data for Jackson County, Alabama (Swenson et al 1954), and the Alabama hydric soil list (http://soils.usda.gov/soil_use/hydric/main.htm).

Field surveys were conducted April 6, 18, and 25-26, 2006 to determine the presence of wetlands between the Bellefonte Nuclear Plant parking lot and the perimeter road to the north of the site. Six forested wetlands were identified within the survey area (Figure 1) covering a total of 11.15 acres (Table 1). Individual wetlands ranged in size from 0.24 acre to 4.05 acres. Wetland boundaries were flagged in the field and mapped with a Trimble ProXRS geographic positioning system unit capable of submeter accuracy. Field data sheets (U. S. Army Corps of Engineers wetland delineation forms) and TVA Rapid Assessment forms are located in Appendix A and B respectively. Representative photographs of the six wetlands delineated in the vicinity of the AP1000 reactor block at Bellefonte are in located in Appendix C.

**Table 1. Wetlands near Proposed New Reactor Construction Area – Bellefonte Nuclear Plant, Alabama**

| Wetland ID | Wetland Type | Acreage | TVARAM Score | TVARAM Category |
|---|---|---|---|---|
| Wetland 1 | PFO1 | 2.46 | 63.5 | 3 |
| Wetland 2 | PFO1 | 4.05 | 69 | 3 |
| Wetland 3 | PFO1 | 0.25 | 35 | 2 |
| Wetland 4 | PFO1 | 1.80 | 55 | 2 |
| Wetland 5 | PFO1 | 0.24 | 60 | 3 |
| Wetland 6 | PFO1 | 2.35 | 63.5 | 3 |
| Total | | 11.15 | | |

Wetland 1 is a forested wetland (2.46 acres) about 100 feet northwest of the AP1000 reactor block (Figure 1). It is associated with two wet weather conveyances that ultimately discharge into Town Creek. Wetland 1 currently receives runoff from part of the proposed construction site. There is a small vernal pool in the center of Wetland 1 that provides important habitat for amphibians and other wildlife at the site. Wetland 1 is a Category 3 wetland indicating a high degree of functionality and ecological value (Table 1). Wetland 1 meets the criteria for a jurisdictional wetland.

Wetland 2 is a forested wetland (4.05 acres) immediately north of the proposed AP1000 reactor block. Wetland 2 is associated with several wet weather conveyances that ultimately discharge into Town Creek. There are at least two groundwater seeps along the southern boundary of the wetland. Wetland 2 currently receives runoff from part of

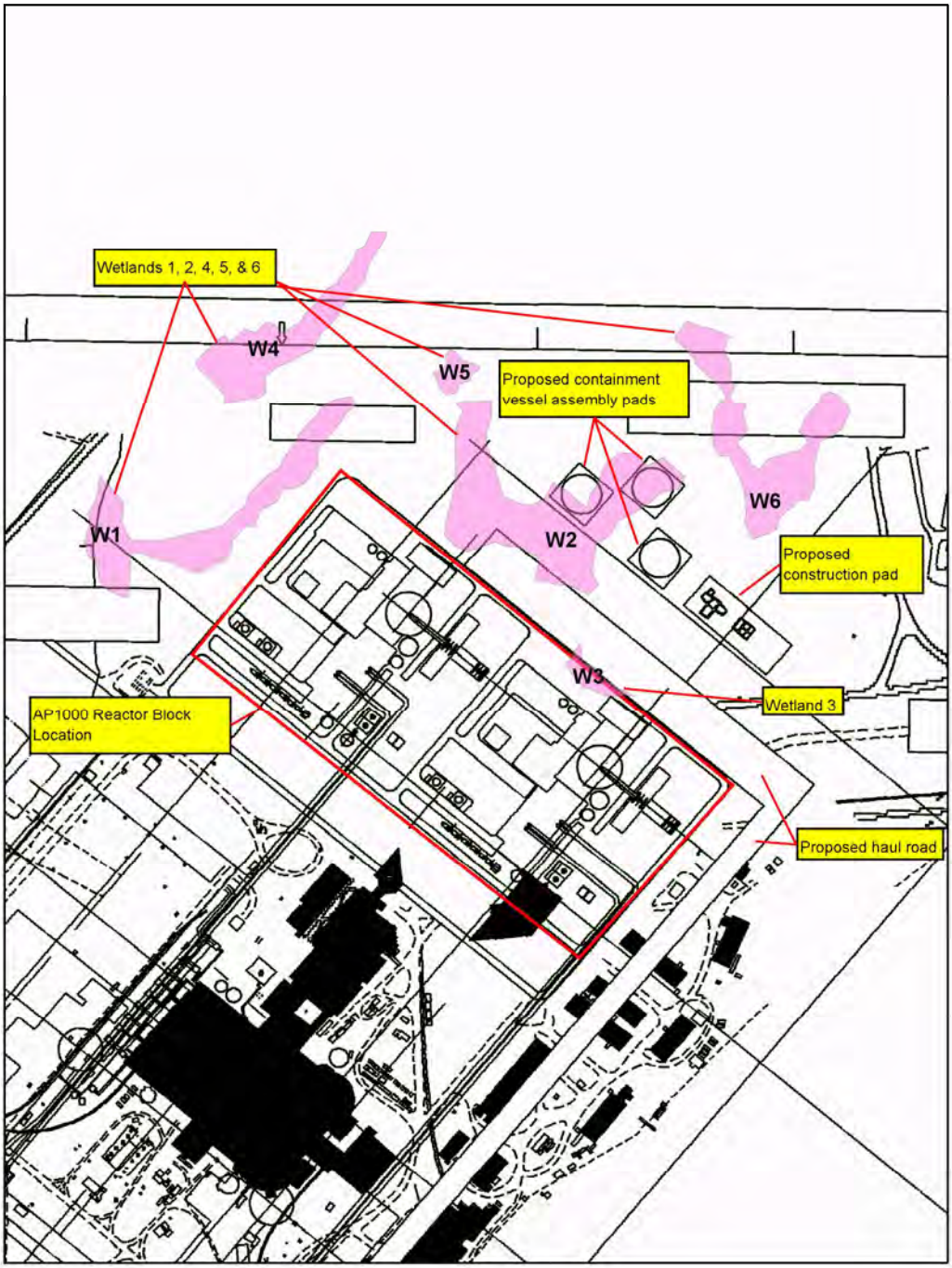



**Figure 1. Location of wetlands at Proposed Bellefonte Nuclear Plant AP1000 Reactor Block construction site.**

the proposed construction site; it could also be directly impacted by the haul road and the containment vessel assembly areas. The northern lobe of Wetland 2 contains several shallow, vernal pools that provide important habitat for amphibians and other wildlife at the site. Wetland 2 is a Category 3 wetland indicating a high degree of

functionality and ecological value (Table 1). Wetland 2 meets the criteria for a jurisdictional wetland.

Wetland 3 is a small forested wetland (0.25 acre) near the northeastern corner of the proposed AP1000 reactor block. It is fed by a groundwater seep. Wetland 2 ultimately receives drainage from Wetland 3 via a wet weather conveyance that exits Wetland 3. Wetland 3 lies directly within the footprint of the proposed construction and the haul road. Wetland 3 is a Category 2 wetland indicating a moderate degree of functionality and ecological value (Table 1). Wetland 3 may not meet the criteria for a jurisdictional wetland.

Wetland 4 is a forested wetland (1.80 acres) north of the proposed AP1000 reactor block along the south side of the northern perimeter road (Figure 1). Wetland 5 should not be affected by the proposed construction project. It is fed by water from a wet weather conveyance at the site. Wetland 4 drains to Town Creek via a roadside drainage ditch along the perimeter road. Wetland 4 is a Category 3 wetland indicating a high degree of functionality and ecological value (Table 1). Wetland 4 meets the criteria for a jurisdictional wetland.

Wetland 5 is a small, forested wetland (0.24 acre) located about 25 feet north of Wetland 2 (Figure 1). Wetland 5 should not be affected by the proposed construction project. The wetland is perched on a stream terrace associated with the wet weather conveyance that drains Wetland 2. Wetland 5 is a Category 2 wetland indicating a moderate degree of functionality and ecological value (Table 1). Wetland 5 may not meet the criteria for a jurisdictional wetland.

Wetland 6 is a forested wetland (2.35 acres) northeast of the proposed AP1000 reactor block along the south side of the northern perimeter road (Figure 1). Wetland 4 should not be affected by the proposed construction project. It is fed by water from a wet weather conveyance at the site. Wetland 6 drains to Town Creek via a roadside drainage ditch along the perimeter road. Wetland 6 is a Category 3 wetland indicating a high degree of functionality and ecological value (Table 1). Wetland 6 meets the criteria for a jurisdictional wetland.

**Potential Construction Impacts**

Preliminary construction plans indicate that the proposed construction of the new reactor units will directly impact at least two of the wetlands (Wetland 2 and Wetland 3) (Figure 2). Wetland 2 (W2) would be impacted by the proposed haul road to the construction site and at least two construction pads for containment vessel assembly. Wetland 3 (W3) would only be affected by the proposed haul road. Wetland 1 would receive stormwater runoff from the proposed construction site. Presumably an aggressive stormwater management plan would prevent or reduce any potential impacts to Wetland 1.

It may be possible to locate temporary construction areas (containment vessel assembly pads and haul roads) to avoid or minimize wetland impacts. Impacts to Wetland 2 could be reduced and minimized by moving two of the containment vessel assembly pads to alternate locations outside the wetland. The two northernmost assembly pads shown in Figure 1 are in the most pristine and ecologically sensitive part of Wetland 2. Figure 2 shows three possible alternate locations for the assembly pads that would reduce the

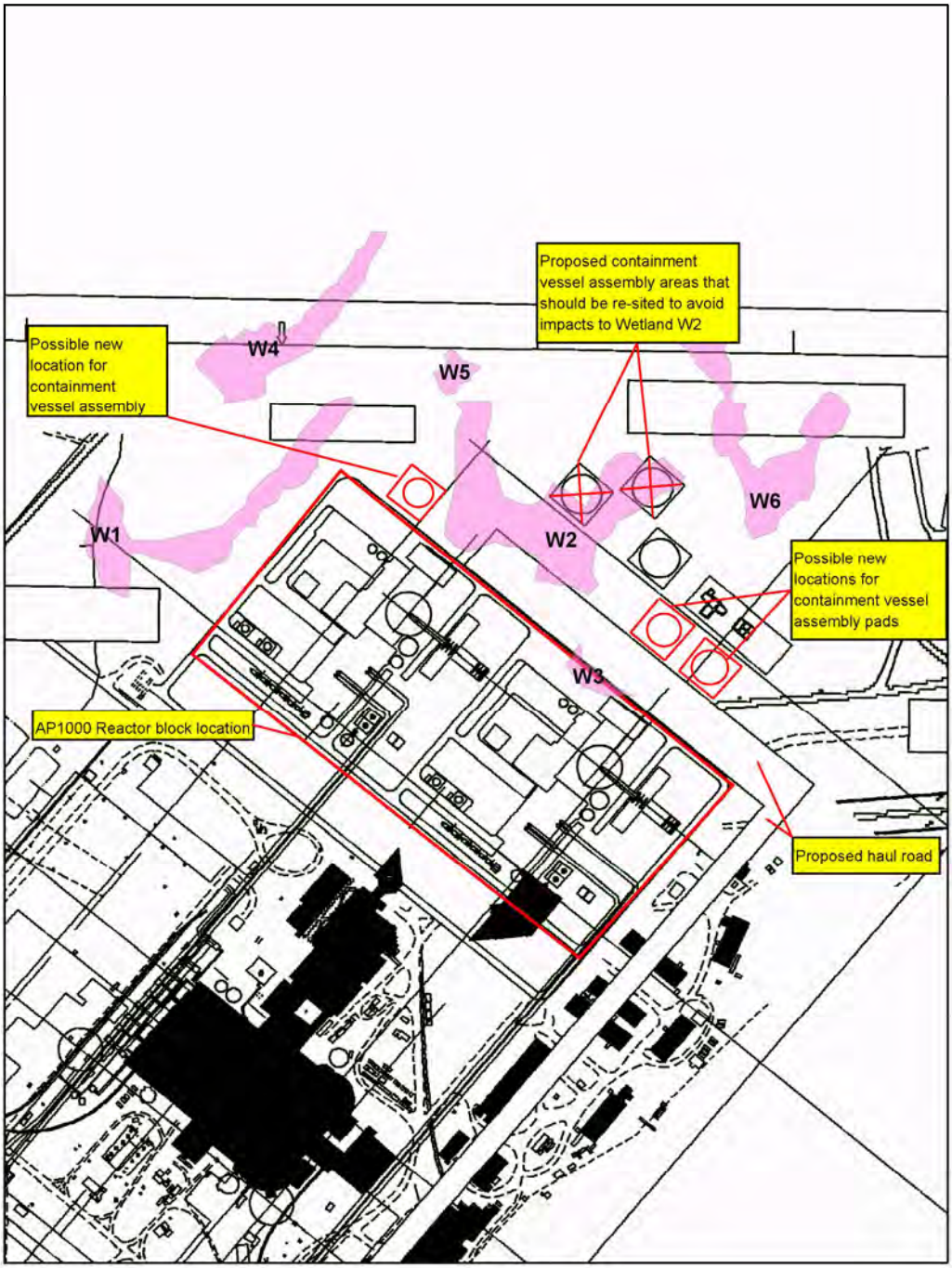



**Figure 2. Alternate containment vessel assembly pad locations to minimize impacts to Wetland 2, Bellefonte Nuclear Plant AP1000 construction site.**

impact to Wetland 2. With the construction plans shown in Figure 1 approximately 2. 7 acres of Wetland 2 would be impacted by the proposed haul road and the two northernmost containment vessel assembly pads. If the two northernmost containment

vessel assembly pads could be located outside Wetland 2, the impact area could be reduced to about 0.6 acre. All of Wetland 3 (0.25 acre) would be affected by the proposed haul road. It appears that impacts to Wetland 3 are unavoidable due to the configuration of the AP1000 reactor block location and the haul road. Thus impacts to wetlands could range from about 2.95 acres with the construction plans depicted in Figure 1 to about 0.85 acre by relocating two of the containment vessel assembly pads.

**Mitigation**

Ultimately detailed construction plans will be required to determine the exact extent of any impacts to the wetlands at the site. If it is not possible to avoid impacts to wetlands, additional compensatory mitigation would likely be required. Early discussions with U.S. Army Corps of Engineers and Alabama Department of Environmental Management will help streamline any issues related to Clean Water Act permits and wetland mitigation requirements. It is likely an Individual Permit will be required for this project.

Mitigation could be accomplished through local wetland mitigation banks if credits are available or through more traditional means (i.e., restoration or creation). Mitigation ratios are likely to be a minimum of 2:1 and may be much higher depending on the ecological functions of affected wetlands. “The type and amount of compensatory mitigation required will be commensurate with the nature and extent of the activity’s adverse impact on aquatic functions and practicable in terms of cost, existing technology, and logistics, in light of the overall project purpose” (USACE 2004). TVA Natural Heritage Wetlands staff stands ready to assist with any discussions or meetings with USACE and development and implementation of wetland mitigation plans for the Bellefonte AP1000 project. Clean Water Act permits would be coordinated out of the USACE Western Regulatory Field Office in Decatur, Alabama:

U.S. Army Corps of Engineers
2042 Beltline Road, SW
Bldg. C, Suite 415
Decatur, Alabama 35601
Phone (256) 350-5620
Fax (256) 350-5499

Wetlands are protected under Sections 404 and 401 of the Clean Water Act and by Executive Order (E.O.) 11990. In order to conduct specific activities in wetlands authorization under a Section 404 Permit from the U. S. Army Corps of Engineers is required. Section 401 gives states the authority to certify whether activities permitted by under Section 404 are in accordance with state water quality standards. Alabama Department of Environmental Management is responsible for Section 401 water quality certifications in Alabama. E.O. 11990 requires all federal agencies to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency’s responsibilities.

Wetland determinations were performed according to US Army Corps of Engineers (USACE) standards (Environmental Laboratory, 1987), which require documentation of hydrophytic vegetation (USFWS 1996), hydric soil, and wetland hydrology. Broader definitions of wetlands, such as the definition provided in Executive Order 11990 (Protection of Wetlands), Alabama state regulatory definitions, the US Fish and Wildlife

Service definition (Cowardin et al. 1979), and the TVA Environmental Review Procedures definition, were also considered in this review.

**References**

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetland and Deepwater Habitats of the United States. Washington, D.C.: U.S. Fish and Wildlife Publication FWS/OBS-79/31.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual, Technical Report Y-87-1. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

Swenson, G. A., R. Wildermuth, B. H. Williams, H. Sherard, C. L. McIntyre, H. P. Thomas, A. Baxter, E. D. McCall, R. S. Farnham, and J. W. Moon. 1954. Soil Survey of Jackson County, Alabama. United States Department of Agriculture, Soil Conservation Service with the Alabama Agricultural Experiment Station, Alabama Department of Agriculture and Industries, and Tennessee Valley Authority.

U.S. Army Corps of Engineers (USACE). 2004. Mitigation Guidelines for the Nashville District Regulatory Program. Nashville District.

U.S. Fish and Wildlife Service. 1996. National List of Vascular Plant Species that Occur in Wetlands: 1996 National Summary.

**U.S. Army Corps of Engineers Information Needs – June 2009**

**Preparation for Bellefonte Units 3 and 4 Corps of Engineers Site Visit, July 8-10, 2009**

**COE INFORMATION NEED: COE-2**

Provide an SME to discuss the wetland investigations that have been performed at the site and be prepared to discuss topics such as:

- Has the entire site been surveyed,
- wetlands found on the site both in the proposed construction foot print and in areas outside the footprint,
- how the recommendations of the May 2006 report (Request #10389 – Bellefonte NP – Wetlands Site Visit: Wetland Input) were investigated and considered in the on site alternatives analysis for construction of Bellefonte Units 3 and 4 for avoidance and minimization of environmental impacts,
- the process TVA has used to demonstrate that the locations selected for BLN units 3 and 4 are the least environmentally damaging practicable alternative (LEDPA), and that other site configurations would result in greater damage
- why the proposed units cannot be situated outside wetlands.

Provide maps of the survey areas to support the discussion.

**BLN RESPONSE:**

TVA confirms that the entire site has been surveyed for wetlands.

Table 2.2-1 lists the USGS land-use categories for areas surrounding the BLN site center point, along with the acreage and percentage of land use for each category within the BLN site, vicinity, and region.

Figures 2.4-1 (BLN Vegetation Coverage), 2.4-2 (BLN Topographic Map), and 2.4-3 (BLN Special Habitats) illustrate wetland areas and site topography, and are provided as attachments.

Subsections 2.3.1.1.5 and 4.2.1.6 describe the wetlands that have been identified within the BLN site, and specifically those within the construction foot print.

Subsection 2.4.1.2.1, Wetlands, provides an extensive discussion on wetlands as an important terrestrial habitat, and the discussion includes results of a 2006 survey and the most recent (June 2008) survey. Wildlife resources that inhabit wetlands are included in the Subsection 2.4.1.3 discussions.

**ATTACHMENTS:**

Figure 2.4-1 BLN Vegetation Coverage

Figure 2.4-2 BLN Topographic Map

Figure 2.4-3 BLN Special Habitats

Request # 10389 – Bellefonte NP – Wetlands Site Visit: Wetland Input

1997 Bellefonte Conversion Project FEIS, Subsection 3.1.1.1, Wetlands

**U.S. Army Corps of Engineers Information Needs – June 2009**

**Preparation for Bellefonte Units 3 and 4 Corps of Engineers Site Visit, July 8-10, 2009**

**COE INFORMATION NEED: COE-3**

Provide an SME and supporting data and information to discuss plans for dredging or other activities to clean out barge slip and intake canal including alternative dredge methods, planned configurations and depths and frequency. Discussion should include:

- Discharge of dredged or fill material into wetlands or waterways,
- dredging performed during construction of Units 1 and 2 including mussels and aquatic organisms observed,
- alternative dredge material disposal sites, recycle options, and treatment/reuse alternatives,
- methods to minimize dredging and construction related turbidity.

**BLN RESPONSE:**

Table 1.2-1 summarizes Federal, State and local environmental authorization, including U.S. Army Corps of Engineers (USACE) authority, requirements, and activities covered.

BLN ER Figure 2.1-1, Site Plot Plan, illustrates the location of the intake canal, barge dock, and blowdown discharge.

ER discussions on dredging activity are located in Subsections 2.4.2.1, 4.1.1.1, 4.2.1.2, 4.2.1.4, 4.2.2.1, 4.2.2.2, 4.2.2.7, 4.3.2.1, 4.3.2.5, 5.2.1.6, and 5.3.1.1.2. Measures and controls to limit adverse impacts during construction are summarized in Table 4.6-1

Subsection 2.4.2.1 indicates that a canal of approximately 8 surface acres was dredged to create the intake canal and provide the cooling water for the Bellefonte Units 1 and 2. Immobile terrestrial organisms were replaced by aquatic communities.

Subsections 4.1.1.1, 4.2.1.2, 4.2.1.4, 4.2.2.1, 4.2.2.2, 4.2.2.7, 4.3.2.1, and 4.3.2.5 discuss the anticipated need for maintenance dredging (de-silting) activity, potential for a temporary increase in turbidity or temporary loss of shoreline habitat, riprap that is already in place to stabilize banks of the intake canal, the disposition of dredge spoils above the 500-year flood plain (see Attachment 5.2-1), and the use of BMPs to stabilize dredge materials and obtain/handle borrow material.

Subsections 5.2.1.6 and 5.3.1.1.2 discuss periodic maintenance desilting, for sediment removal only, during operations. Subsection 5.3.1.1.2 also characterizes the intake channel.

<u>Previous and Planned Dredging</u>

TVA responded to NRC Information Needs H-41 and AQ-23, and that response follows:

> "The original dredging of the intake channel and construction of the pumping station at the BLN site was completed in 1977. The intake channel was last dredged in January 1987. Divers inspected the channel in the 1990s and reported that the channel would need desilting

prior to completing the plant and running the pumps at the intake. As stated in Subsection 6.3.4, a bathymetric survey of the intake channel is expected following the first year of operation to measure sediment build up and determine future dredging intervals. Currently, maintenance desilting in the area of the BLN intake structures is expected to be conducted approximately every 12 to 15 years, based on the maintenance desilting conducted at the nearby Widows Creek Fossil Plant. The extent of desilting of the intake canal is expected to include the 200-ft.-wide base of the intake canal, with particular concentration on the 25-ft.-wide channel cut in the center of the intake canal. Maintenance dredging of the discharge line is not anticipated during operation, because the mixing action of the diffuser and the river flow at this location (approximately 300 feet out in Guntersville Reservoir) are expected to minimize sedimentation rates. No desilting activities are anticipated for the discharge structure and associated piping other than an inspection to evaluate the discharge structure and piping physical condition. Impacts of these maintenance activities, as stated in the ER, are expected to be minimal."

In response to NRC RAI 5.2-1, TVA further defined the on-site area to be used for dredge spoil deposition:

"The area within the 500-year floodplain and the area of potential effect (APE) that is expected to be used for dredged material deposition (spoils) is illustrated in Attachment 5.2-1 as the cross-hatched area that lies between E625,000 and E626,000 and between N1,529,000 and N1,530,000. This figure is a marked up excerpt from TVA/BLN Drawing DWG-NUSTART-004, which was provided as Attachment C in the referenced TVA letter dated June 12, 2008." Attachment 5.2-1 is provided as an attachment to this response.

ER Subsections 4.2.1.4 and 5.2.1.6 were corrected (in Revision 1) to indicate that USACE pre-construction permits are not required, because the dredge spoils are planned to be placed in an upland, on-site spoils disposal area that is above the 500-year floodplain.

In response to NRC Information Need H-43 regarding how raw water be provided during dredging or de-silting the intake channel, TVA provided the following:

"The service water system (SWS) cooling tower basin has a 12-hour raw water hold-up capacity (see DCD Tier 2, page 9.2-3), which allows continued operation of both Units 3 and 4 during the maintenance dredging (desilting) of the intake channel. Prior to initiating maintenance dredging activities, TVA will assess the planned activity to determine whether the location and duration of the dredging activity would be expected to impact plant construction operations. If the maintenance dredging operation is in a location that would have an adverse affect on raw water quality and the duration of the operation is greater than the hold-up capacity of the SWS cooling tower basin, an alternate makeup water supply may be provided."

<u>Practices and Methods to Minimize Dredging and Construction-Related Effects</u>

In response to Sufficiency Review comments ER04, 11, 43, 44, and 45, TVA provide the following clarification, and the ER text changes noted were incorporated into Revision 1 of the ER.

"[Note: This response addresses comments pertaining to modifications to existing structures and features at the Bellefonte site. Comments regarding the location borrow and dredge material are addressed in response to comments ER40 and ER46 and the comment regarding

the description of cultural and historical overview of the region is addressed in response to comment ER11.]

Activities associated with existing systems and equipment are considered to be maintenance activities, rather than modification. These include intake and discharge canal and structures, barge dock, and transmission line corridors. For example, plans are to restore the barge dock to its "original" size (i.e., maintenance/refurbishment), rather than to modify it. Also, the intake canal area maintenance dredging (rather than a dredging activity resulting in modification of intake area) is anticipated during construction. The ER text for subsections 4.2.1.2 and 4.2.1.4 will be revised to clearly identify dredging as a maintenance activity, and provide detail related to riprap installation. The location of the intake canal and barge unloading dock, are depicted on Figure 2.1-1. The extent of desilting of the intake canal is expected to include the 200-ft. wide base of the intake canal, particularly concentrating on the 25-ft. wide channel cut in the center of the intake canal. Figure 3.4-2 illustrates the intake canal, and provides details of the existing riprap placement. In that the discharge structure piping, as shown in Figure 3.4-3, is located at a 60 degree angle 300 feet out in the Guntersville Reservoir, maintenance dredging is not considered warranted. No construction activities are anticipated for the discharge structure and associated piping other than an inspection to evaluate the discharge structure and piping physical condition. Impacts of these maintenance activities during the construction period, as stated in the ER, are expected to be minimal. The anticipated environmental impacts are discussed in the associated Chapter 4 subsections relating to the noted maintenance activities.

To provide clarification related to maintenance and refurbishment activities, ER Subsections 4.2.1.1, 4.2.1.2, 4.2.1.4, 4.2.1.8, 4.2.2.7, 4.3.2.1, 4.3.2.5, and 5.3.1.1.2 and Table 4.6-1 are revised, as described below."

In response to NRC Information Need AQ-20 and AQ-21, regarding bank stabilization and activities that might affect the banks/shoreline, TVA provided the following:

"By correspondence dated May 2, 2008, TVA provided responses to comments made by the NRC reviewers during the sufficiency review of the BLN COLA, including the Applicant's Environmental Report. In response to certain elements of comments ER04, 11, 43, 44, and 45, TVA addressed the NRC reviewers' questions regarding measures to stabilize banks of the intake canal embayment and provided clarification that no new construction is planned. Also, as stated during the site audit, riprap installation for river bank stabilization was completed as part of Bellefonte Units 1 and 2 construction activities. There are no plans for installation of additional riprap or any stemwalls. Any refurbishment of existing structures such as the intake canal or barge docking area, during Units 3 and 4 construction, would be more accurately characterized as a maintenance activity. Changes to the BLN ER to clarify maintenance characterization for activities described on ER pages 4.2-1 and 4.2-2, and riprap installation were provided as part of the response to comments ER04, 11, 43, 44, and 45.

As applicable to developments for which TVA is issuing a permit under Section 26a of the TVA Act, TVA requirements, guidelines and best management practices (BMPs) for installing riprap, stemwalls, and other means to stabilize embankments are described in two documents: "Regulation_1304.208" and "GS_Conditions (General and Standard Conditions – Sections 3 and 6)." These documents are provided as Enclosure 2, Attachments B and C, respectively. As modified for site-specific application, TVA typically identifies similar

conditions and BMPs for implementation in TVA-initiated projects. However, as stated above, riprap installation is complete; there are no plans for installation of additional riprap or stemwalls."

NRC also issued Information Need AQ-24 regarding TVA regulations related to dredging operations, and TVA responded with the following:

> "During the week of March 31 through April 4, 2008, the NRC staff conducted an audit of the BLN site, including a review of the documentation supporting the BLN ER. At the site audit exit meeting, NRC Aquatic Ecology reviewers identified additional documentation needs. This document, "General and Standard Conditions, Section 26a and Land Use," is provided in response to Information Need AQ-20 and AQ-21 and provided as Attachment C to this enclosure. In addition to this document, clarification on TVA regulations related to dredging is provided below.
>
> TVA's proposed activities at the BLN site include possible maintenance dredging needed to desilt the intake canal to return it to its originally constructed contour or capacity. Desilting or dredging procedures, guidelines, and BMPs are not specifically outlined in TVA regulations. In the State of Alabama, if a permit is needed, the requirements for such activities would typically fall under the requirements of either a general or site-specific U.S. Army Corps of Engineers (USACE) permit. If a USACE permit is not required, TVA would stipulate general conditions and BMPs similar to those established in Section 6 of TVA's General and Standard Conditions, which is attached to this enclosure. The types of BMPs implemented would be dependent upon where the desilting or maintenance dredging operation were to take place (intake, discharge, river); how the operation would be conducted (e.g., hydraulic dredge, clam shell removal, or other less intrusive methodologies); and where the material was to be placed. For other previous agency desilting or dredging projects, and depending upon site-specificity, TVA has 1) pumped or dredged materials into geotec filterbags/socks to filter out sediment as the water is returned to the river; 2) used sediment curtains; 3) used visual monitoring and ceased activities if sediment is stirred up and may enter the plant intake; 4) placed a dredge cell with a berm and allowed to de-water; and 5) explored and utilized other less-intrusive methods, if such activities of less extensive scope and potential for impacts warranted them."

<u>Mussel/Aquatic Organism Surveys and Observations</u>

Discussions on surveys/observations of aquatic organisms, including mussels, are provided in ER Subsections 2.4.2.4 (Aquatic Communities), 2.4.2.5.1 (Federal-Listed Threatened and Endangered Species), 2.4.2.5.2 (State-Listed Threatened and Endangered Species), 2.4.2.5.3 (Species of Commercial or Recreational Value), and 2.4.2.5.4 (Nuisance Species).

Construction effects on aquatic resources are discussed in ER Subsection 4.3.2, Aquatic Ecosystems. Subsections 4.3.2.5 and 4.3.2.6 address construction effects on fisheries resources and important aquatic species.

**ATTACHMENTS:**

ER Figure 2.2-1 Site Plot Plan

18 CFR 1304.208, Shoreline Stabilization on TVA-Owned Residential Access Shoreland.

Tennessee Valley Authority, Form TVA 17416[5-2005], General and Standard Conditions, Section 26a and Land Use.

RAI 5.2-1 Attachment 5.2-1

NEW UNITS 3 & 4 GENERATION FACILITY LEGEND:

1. CONTAINMENT/SHIELD BUILDING
2. TURBINE BUILDING
3. ANNEX BUILDING
4. AUXILIARY BUILDING
5. SWS COOLING TOWERS
7. RADWASTE BUILDING
10. DIESEL GENERATOR BUILDING
13. FIRE WATER/CLEARWELL STORAGE TANK
14. FIRE WATER STORAGE TANK
15. TRANSFORMER AREA
17. CONDENSATE STORAGE TANK
18. DIESEL GENERATOR OIL STORAGE TANKS
19. DEMINERALIZED WATER STORAGE TANK
20. BORIC ACID STORAGE TANK
22. TURBINE BUILDING LAYDOWN AREA
25. PASSIVE CONTAINMENT COOLING ANCILLARY WATER STORAGE TANK
26. DIESEL-DRIVEN FIRE PUMP/ENCLOSURE
99. T-PAD FOR CRANE

BUILDING LEGEND:

1. NEW PRIMARY ACCESS PORTAL & SECONDARY ALARM STATION
2. NEW ADMINISTRATION BUILDING
3. REMOVE EXIST BLDGS.
4. NEW MAINTENENCE BUILDING
5. NEW MATERIAL RECEIVING & SALLY PORT BUILDING
6. EXISTING SIMULATOR BUILDING
7. EXISTING UNIT 1 & 2 BUILDINGS
8. EXISTING SITE TRAINING BLDG
9. NEW SITE PARKING
10. EXISTING SWITCHYARD
11. NEW OUTAGE PARKING
12. EXISTING COOLING TOWERS
13. NEW SECURITY FENCE ASSY.
14. NEW SWITCHYARD BUILDING
15. EXISTING STORAGE AREA
16. NEW SECURITY ACCESS BLDG
17. NEW CIRCULATING PUMPS
18. NEW PSO SWITCHYARD FACILITY
19. EXISTING SECURITY RANGE FACILITY
20. NEW SECURITY TRAINING BUILDING
21. NEW TECH SUPPORT CENTER (WITHIN MAINTENECE BUILDING)
22. NEW H2 STORAGE BUILDING
23. NEW HAZ. WASTE STORAGE BUILDING
24. EXISTING INTAKE PUMPING STATION
25. NEW TSC DIESEL GENERATOR BUILDING

POND LEGEND:

POND A - YARD DRAINAGE POND
WWRB - WASTE WATER RETENTION BASIN
POND C - CONCENTRATED CHEMICAL TREATMENT POND (LINED)
POND D - DESILTING POND
POND E - ALUM SLUDGE PONDS

NOTES:

1. ELEVATIONS SHOWN ARE BASED ON MEAN SEA LEVEL (MSL).
2. EXISTING CONDITIONS AND TOPOGRAPHIC CONTOURS BASED UPON THE SANBORN MAP COMPANY, INC. PHOTOGRAMMETRIC SURVEY PERFORMED ON MARCH 26,2006 PROJECT NO. 060319.
3. CONTOUR INTERVAL IS 5 FEET.
4. 1000 FOOT GRID AND COORDINATE VALUES ARE BASED UPON AL EAST STATE PLANE COORDINATE SYSTEM NAD 83.

0 300 600 900
GRAPHIC SCALE (FEET)
1 INCH = 300 FT

**FIGURE 2.1-1**
**Site Plot Plan**

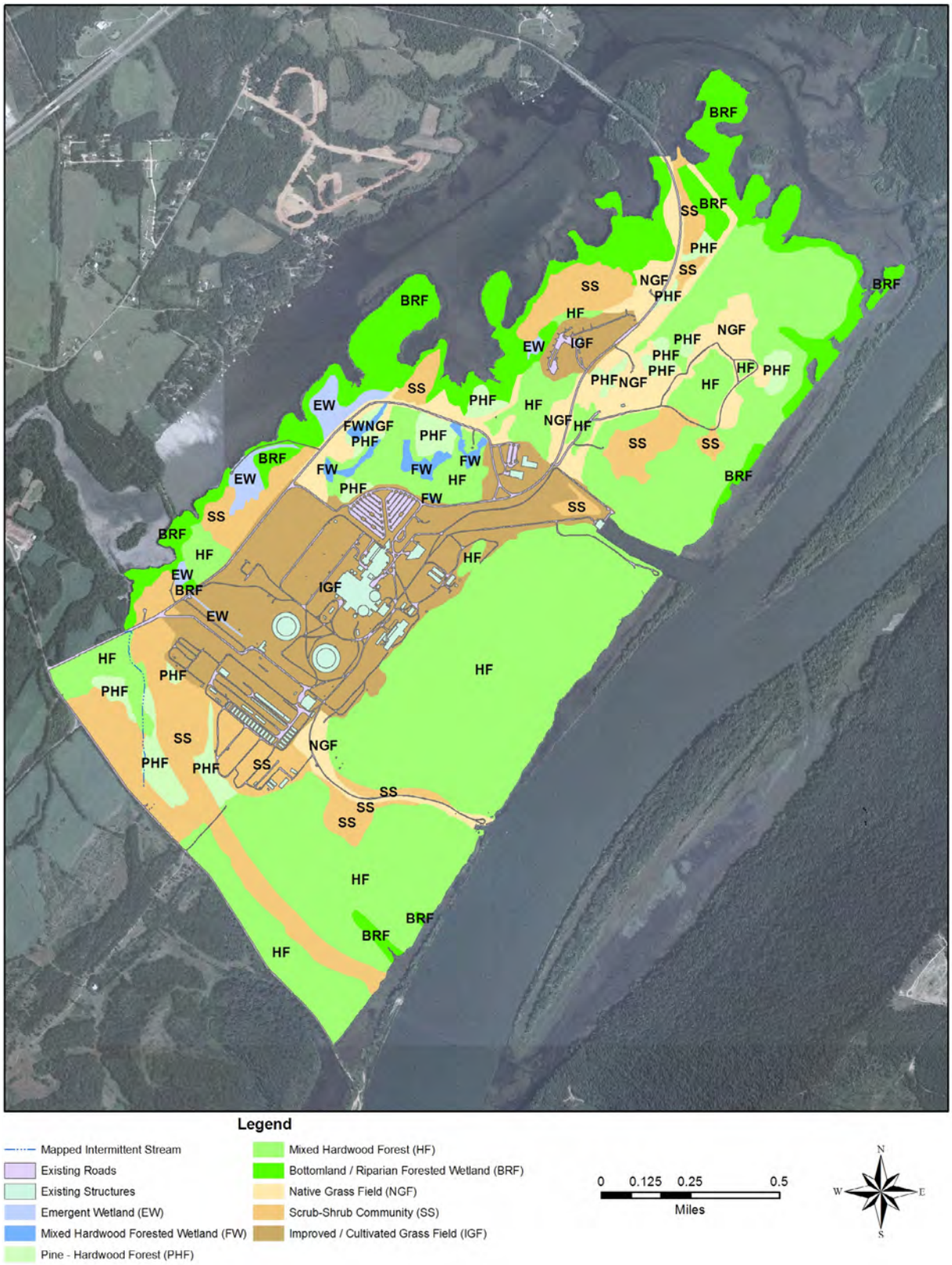
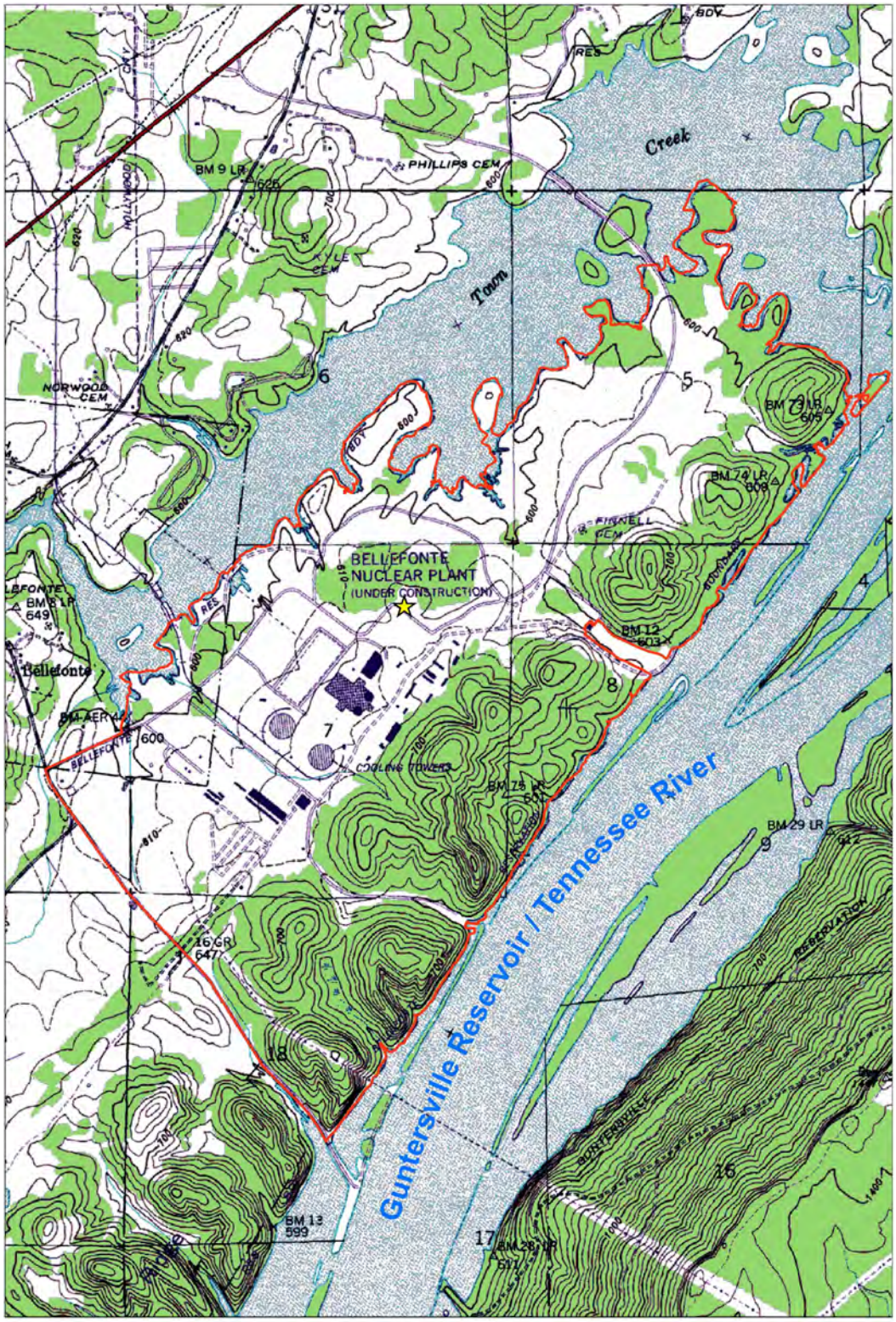



**FIGURE 2.4-1**
**BLN Vegetation Coverage**




**Legend**

Site Center Point

BLN Property Boundary

SOURCE: USGS Topo Map, Hollywood, AL (1980)

**FIGURE 2.4-2**
**BLN Topographic Map**

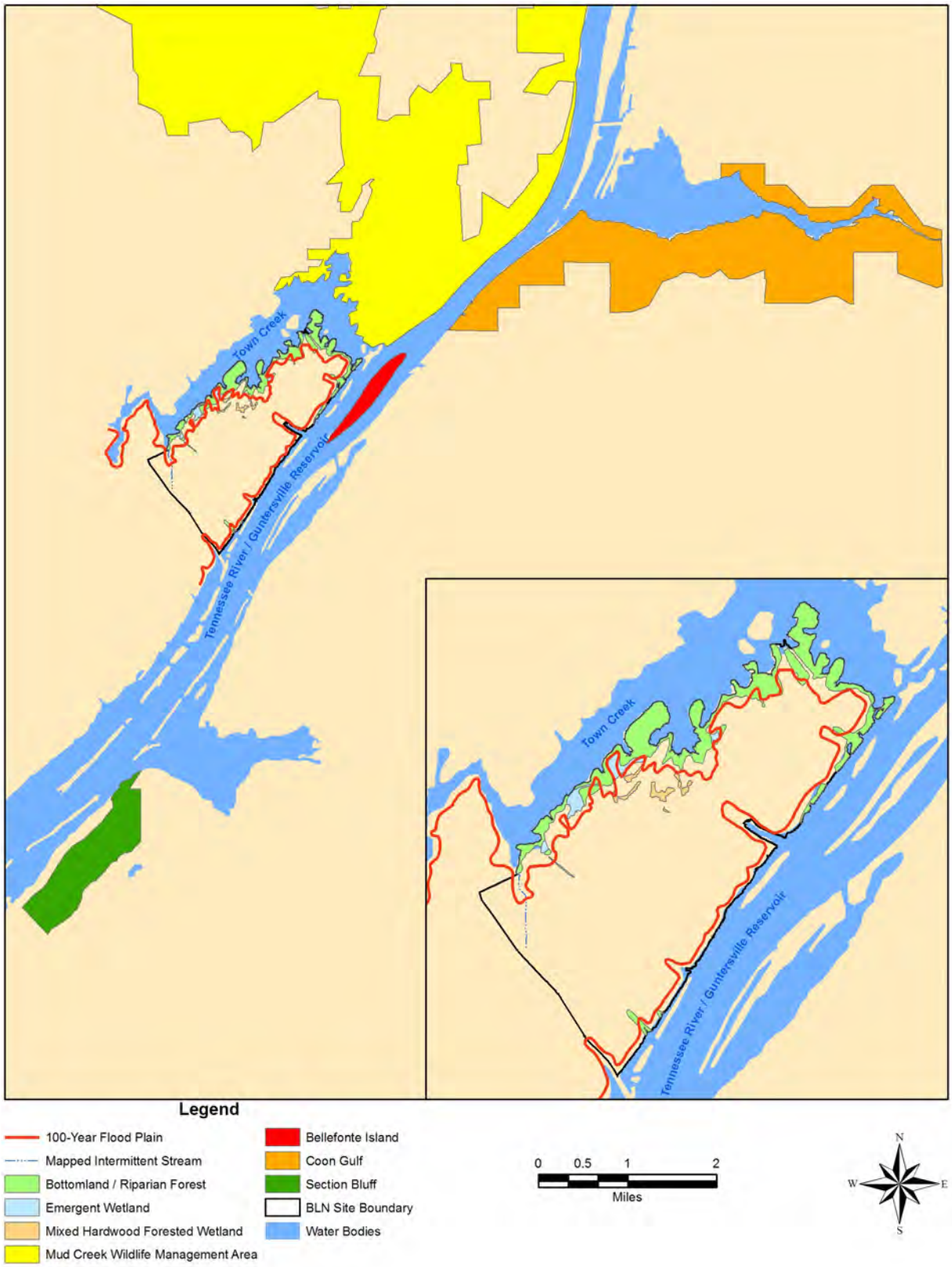
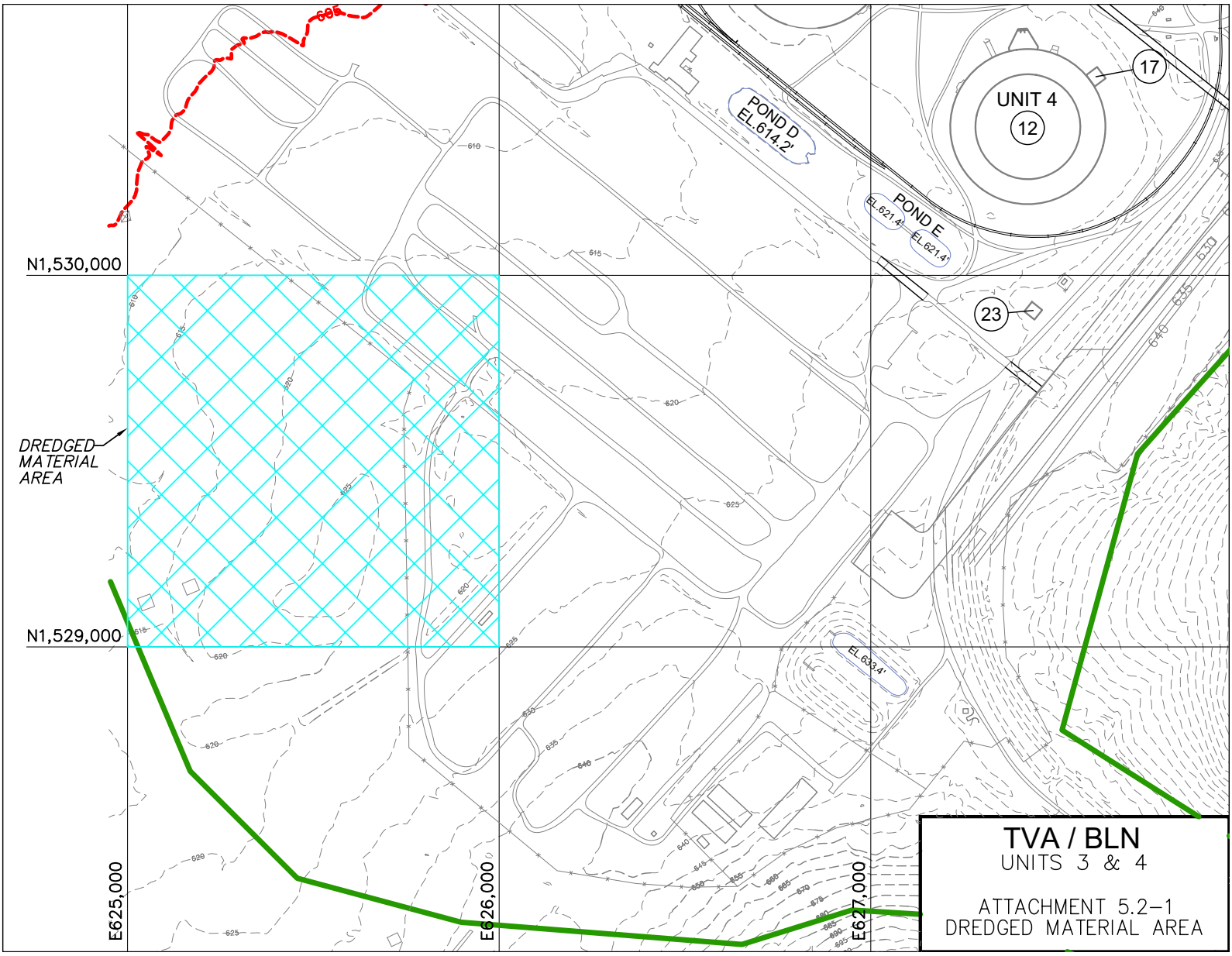



**FIGURE 2.4-3**
**BLN Special Habitats**


N1,530,000
N1,529,000
E625,000
E626,000
E627,000
DREDGED MATERIAL AREA
POND D
EL.614.2'
POND E
EL.621.4'
EL.621.4'
EL.633.4'
UNIT 4
12
17
23
TVA / BLN
UNITS 3 & 4
ATTACHMENT 5.2-1
DREDGED MATERIAL AREA

# GENERAL AND STANDARD CONDITIONS
# Section 26a and Land Use

**General Conditions**

1. You agree to make every reasonable effort to construct and operate the facility authorized herein in a manner so as to minimize any adverse impact on water quality, aquatic life, wildlife, vegetation, and natural environmental values.
2. This permit may be revoked by TVA by written notice if:
   a) the structure is not completed in accordance with approved plans;
   b) if in TVA's judgment the structure is not maintained as provided herein;
   c) the structure is abandoned;
   d) the structure or work must be altered to meet the requirements of future reservoir management operations of the United States or TVA, or:
   e) TVA finds that the structure has an adverse effect upon navigation, flood control, or public lands or reservations.
3. If this permit for this structure is revoked, you agree to remove the structure, at your expense, upon written notice from TVA. In the event you do not remove the structure within 30 days of written notice to do so, TVA shall have the right to remove or cause to have removed, the structure or any part thereof. You agree to reimburse TVA for all costs incurred in connection with removal.
4. In issuing this Approval of Plans, TVA makes no representations that the structures or work authorized or property used temporarily or permanently in connection therewith will not be subject to damage due to future operations undertaken by the United States and/or TVA for the conservation or improvement of navigation, for the control of floods, or for other purposes, or due to fluctuations in elevations of the water surface of the river or reservoir, and no claim or right to compensation shall accrue from any such damage. By the acceptance of this approval, applicant covenants and agrees to make no claim against TVA or the United States by reason of any such damage, and to indemnify and save harmless TVA and the United States from any and all claims by other persons arising out of any such damage.
5. In issuing this Approval of Plans, TVA assumes no liability and undertakes no obligation or duty (in tort, contract, strict liability or otherwise) to the applicant or to any third party for any damages to property (real or personal) or personal injuries (including death) arising out of or in any way connected with applicant's construction, operation, or maintenance of the facility which is the subject of this Approval of Plans.
6. This approval shall not be construed to be a substitute for the requirements of any federal, state, or local statute, regulation, ordinance, or code, including, but not limited to, applicable electrical building codes, now in effect or hereafter enacted.
7. The facility will not be altered, or modified, unless TVA's written approval has been obtained prior to commencing work.
8. You agree to notify TVA of any transfer of ownership of the approved structure to a third party. Third party is required to make application to TVA for permitting of the structure in their name.
9. You agree to stabilize all disturbed areas within 30 days of completion of the work authorized. All land-disturbing activities shall be conducted in accordance with Best Management Practices as defined by Section 208 of the Clean Water Act to control erosion and sedimentation to prevent adverse water quality and related aquatic impacts. Such practices shall be consistent with sound engineering and construction principles; applicable federal, state, and local statutes, regulations, or ordinances; and proven techniques for controlling erosion and sedimentation, including any *required* conditions.
10. You agree not to use or permit the use of the premises, facilities, or structures for any purposes that will result in draining or dumping into the reservoir of any refuse, sewage, or other material in violation of applicable standards or requirements relating to pollution control of any kind now in effect or hereinafter established.
11. The facility will be maintained in a good state of repair and in good, safe, and substantial condition. If the facility is damaged, destroyed, or removed from the reservoir or stream for any reason, or deteriorates beyond safe and serviceable use, it cannot be repaired or replaced without the prior written approval of TVA.
12. You agree that if any historical or prehistoric archaeological material (such as arrowheads, broken pottery, bone or similar items) is encountered during construction of this facility you will immediately contact this office and temporarily suspend work at that location until authorized by this office to proceed.
13. The Native American Graves Protection and Repatriation Act and the Archaeological Resources Protection Act apply to archaeological resources located on the premises. If LESSEE {or licensee or grantee (for easement) or applicant (for 26a permit on federal land)} discovers human remains, funerary objects, sacred objects, objects of cultural patrimony, or any other archaeological resources on or under the premises, LESSEE {or licensee, grantee, or applicant} shall immediately stop activity in the area of the discovery, make a reasonable effort to protect the items, and notify TVA by telephone (phone _____). Work may not be resumed in the area of the discovery until approved by TVA.

14. On TVA land, unless otherwise stated on this permit, vegetation removal is prohibited.

15. You agree to securely anchor all floating facilities to prevent them from floating free during major floods.

16. You are responsible for accurately locating your facility, and this authorization is valid and effective only if your facility is located as shown on your application or as otherwise approved by TVA in this permit. The facility must be located on land owned or leased by you, or on TVA land at a location approved by TVA.

17. It is understood that you own adequate property rights at this location. If at any time it is determined that you do not own sufficient property rights, or that you have only partial ownership rights in the land at this location, this permit may be revoked if TVA receives an objection to your water use facility from any owner or partial owner of the property rights at this location.

**Standard Conditions:** (Items that pertain to your request have been checked.)

**1. Structures and Facilities**

a) ☐ TVA number _____ has been assigned to your facility. When construction is complete, this number shall be placed on a readily visible part of the outside of the facility in the numbers not less than three inches high.

b) ☐ The 100-year flood elevation at this site is estimated to be _____-feet mean sea level. As a minimum, your fixed facility should be designed to prevent damage to stored boats by forcing them against roof during a 100-year flood event.

c) ☐ You agree that the float will be temporarily connected (i.e., by slip pin/ropes) and not permanently attached to nonnavigable houseboat.

d) ☐ You agree that this _____ shall have no side enclosures except wire mesh or similar screening.

e) ☐ Buildings or other enclosed structures containing sleeping or living accommodations, including toilets and related facilities, or that have enclosed floor area in excess of 32 square feet, are prohibited.

f) ☐ Ski jumps will not be left unattended for extended periods of time. All facilities will be tied to the shoreline or to a boathouse or pier fronting your property at the completion of each day's activities.

g) ☐ For all electrical services permitted, a disconnect must be located at or above the _____-foot contour that is accessible during flooding.

h) ☐ You should contact your local government official(s) to ensure that this facility complies with all applicable local floodplain regulations.

i) ☐ The entire closed-loop coil heating and air conditioning system and its support apparatus must be either placed below elevation _____ (to provide a five-foot clearance for water craft at minimum pool elevations of _____) or located underneath a TVA approved water-use facility or other TVA approved structure. The supply and return lines must be buried as they cross the reservoir drawdown zone in areas of water depth less than five feet (minimum pool). The liquid contents of the closed-loop heating and air conditioning system must be propylene glycol or water, and the applicant or authorized agent must provide TVA with written verification of this fact.

j) ☐ You agree that only those facilities which have been approved by TVA prior to construction will be placed within the harbor limits and that permanent mooring buoys, boat slips, or other harbor facilities will not be placed outside the harbor limits.

k) ☐ You agree that all storage, piping, and dispensing of liquid fuel shall comply with applicable requirements of the "Flammable and Combustible Liquids" section of the National Fire Codes and any additional requirements of federal, state, and local laws and regulations.

l) ☐ You agree that the _____ facility hereby approved will be used for _____ and for no other purpose unless approved in writing from TVA.

m) ☐ You agree that if the construction project covered by this permit is not initiated within (18) months after the date of issuance, this permit will then automatically expire and you must submit a new 26a permit application for TVA approval with the applicable fee.

**2. Ownership Rights**

a) ☐ No fill will be placed higher than elevation _____ maximum shoreline contour (msc), and every precaution will be taken not to disturb or alter the existing location of the _____-foot contour elevation through either excavation or placement of fill.

b) ☐ You are advised that TVA retains the right to flood this area and that TVA will not be liable for damages resulting from flooding.

c) ☐ You shall notify TVA of any sale or transfer of land, which would affect the landward limits of harbor area, as far in advance of such sale or transfer as possible.

d) ☐ This approval of plans is only a determination that these harbor limits will not have any unacceptable effect on TVA programs or other interests for which TVA has responsibility. Such approval does not profess or intend to give the applicant exclusive control over the use of navigable waters involved.

e) ☐ You recognize and understand that this authorization conveys no property rights, grants no exclusive license, and in no way restricts the general public's privilege of using shoreland owned by or subject to public access rights owned by TVA. It is also subject to any existing rights of third parties. Nothing contained in this approval shall be construed to detract or deviate from the rights of the United States and TVA held over this land under the Grant of Flowage Easement. This Approval of Plans does not give any property rights in real estate or material and does not authorize any injury to private property or invasion of private or public rights. It merely constitutes a finding that the facility, if constructed at the location specified in the plans submitted and in accordance with said plans, would not at this time constitute an obstruction unduly affecting navigation, flood control, or public lands or reservations.

**3. Shoreline Modification and Stabilization**

a) ☐ For purposes of shoreline bank stabilization, all portions will be constructed or placed, on average, no more than two feet from the existing shoreline at normal summer pool elevation.

b) ☐ You agree that spoil material will be disposed of and contained on land lying and being above the _____-foot contour. Every precaution will be made to prevent the reentry of the spoil material into the reservoir.

c) ☐ Bank, shoreline, and floodplain stabilization will be permanently maintained in order to prevent erosion, protect water quality, and preserve aquatic habitat.

d) ☐ You agree to reimburse TVA $_____, which is the current value of the _____ acre feet of power storage volume displaced by fill into the reservoir.

**4. Water Intake**

a) ☐ If the reservoir falls below the elevation of the intake, the applicant will be responsible for finding another source of raw water.

b) ☐ You must install and maintain a standard regulatory hazard buoy at the end of the intake to warn boaters of the underwater obstruction. The word “intake” should be added to the buoy and be attached using a five-foot cable.

c) ☐ The screen openings on the intake strainer must be 1/8-inch (maximum), to minimize the entrapment of small fish.

d) ☐ This approval does not constitute approval of the adequacy or safety of applicant’s water system. TVA does not warrant that the water withdrawn and used by applicant is safe for drinking or any other purpose, and applicant is solely responsible for ensuring that all water is properly treated before using.

**5. Bridges and Culverts**

a) ☐ You agree to design/construct any instream piers in such a manner as to discourage river scouring or sediment deposition.

b) ☐ Applicant agrees to construct culvert in phases, employing adequate streambank protection measures, such that the diverted streamflow is handled without creating streambank or streambed erosion/sedimentation and without preventing fish passage.

c) ☐ Concrete box culverts and pipe culverts (and their extensions) must create/maintain velocities and flow patterns which offer refuge for fish and other aquatic life, and allow passage of indigenous fish species, under all flow conditions. Culvert floor slabs and pipe bottoms must be buried below streambed elevation, and filled with naturally occurring streambed materials. If geologic conditions do not allow burying the floor, it must be otherwise designed to allow passage of indigenous fish species under all flow conditions.

d) ☐ All natural stream values (including equivalent energy dissipation, elevations, and velocities; riparian vegetation; riffle/pool sequencing; habitat suitable for fish and other aquatic life) must be provided at all stream modification sites. This must be accomplished using a combination of rock and bioengineering, and is not accomplished using solid, homogeneous riprap from bank to bank.

e) ☐ You agree to remove demolition and construction by-products from the site--for recycling if practicable, or proper disposal--outside of the 100-year floodplain. Appropriate BMPs will be used during the removal of any abandoned roadway or structures.

**6. Best Management Practices**

a) ☐ You agree that removal of vegetation will be minimized, particularly any woody vegetation providing shoreline/streambank stabilization.

b) ☐ You agree to installation of cofferdams and/or silt control structures between construction areas and surface waters prior to any soil-disturbing construction activity, and clarification of all water that accumulates behind these devices to meet *state* water quality criteria *at the stream mile where activity occurs* before it is returned to the *unaffected portion of the stream*. Cofferdams must be used wherever construction activity is at or below water elevation.

c) ☐ A floating silt screen extending from the surface to the bottom is to be in place during excavation or dredging to prevent sedimentation in surrounding areas. It is to be left in place until disturbed sediments are visibly settled.

d) ☐ You agree to keep equipment out of the reservoir or stream and off reservoir or stream banks, to the extent practicable (i.e., performing work "in the dry").

e) ☐ You agree to avoid contact of wet concrete with the stream or reservoir, and avoid disposing of concrete washings, or other substances or materials, in those waters.

f) ☐ You agree to use erosion control structures around any material stockpile areas.

g) ☐ You agree to apply clean/shaken riprap or shot rock (where needed at water/bank interface) over a water permeable/soil impermeable fabric or geotextile and in such a manner as to avoid stream sedimentation or disturbance, or that any rock used for cover and stabilization shall be large enough to prevent washout and provide good aquatic habitat.

h) ☐ You agree to remove, redistribute, and stabilize (with vegetation) all sediment which accumulates behind cofferdams or silt control structures.

i) ☐ You agree to use vegetation (versus riprap) wherever practicable and sustainable to stabilize streambanks, shorelines, and adjacent areas. These areas will be stabilized as soon as practicable, using either an appropriate seed mixture that includes an annual (quick cover) as well as one or two perennial legumes and one or two perennial grasses, or sod. In winter or summer, this will require initial planting of a quick cover annual only, to be followed by subsequent establishment of the perennials. Seed and soil will be protected as appropriate with erosion control netting and/or mulch and provided adequate moisture. Streambank and shoreline areas will also be permanently stabilized with native woody plants, to include trees wherever practicable and sustainable (this vegetative prescription may be altered if dictated by geologic conditions or landowner requirements). You also agree to install or perform additional erosion control structures/techniques deemed necessary by TVA.

**<u>Additional Conditions</u>**