Tennessee Valley Authority, 1101 Market Street, LP 5A, Chattanooga, Tennessee 37402-2801

August 22, 2008

10 CFR 52.80

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

In the Matter of	)	Docket Numbers	52-014 and 52-015
Tennessee Valley Authority	)		

BELLEFONTE COMBINED LICENSE APPLICATION – RESPONSE TO ENVIRONMENTAL REPORT REQUEST FOR ADDITIONAL INFORMATION – CONSTRUCTION/PRECONSTRUCTION IMPACT SEPARATION PER 10 CFR 51.45(c)

Reference: Letter from Mallecia Hood (NRC) to Ashok S. Bhatnagar (TVA), Request for Additional Information Regarding the Environmental Review of the Combined License Application for Bellefonte Nuclear Plant, Units 3 and 4, dated July 11, 2008. [ML081840493].

This letter provides the Tennessee Valley Authority's (TVA) response to a Nuclear Regulatory Commission (NRC) request for additional information (RAI) items included in the reference letter.

The enclosure to this letter provides a response to the NRC RAI identified in the reference letter as "10 CFR 51.45(c)," which is related to the separation of construction and preconstruction impacts in accordance with the revised Limited Work Authorization (LWA) rule. The enclosed RAI response also identifies any associated changes that will be made in a future revision of the BLN application.

If you should have any questions, please contact Thomas Spink at 1101 Market Street, LP5A, Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7062, or via email at tespink@tva.gov.

D085
NRO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 22nd day of Aug, 2008.

Andrea L. Sterdis
Manager, New Nuclear Licensing and Industry Affairs
Nuclear Generation Development & Construction

Enclosure:

Response to Environmental Report Request for Additional Information – Construction/ Preconstruction Impact Separation per 10 CFR 51.45(c)

cc (Enclosure):
M. A. Hood, NRC/HQ

cc (w/o Enclosure):
S.P. Frantz, Morgan Lewis
M.W. Gettler, FP&L
R.C. Grumbir, NuStart
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G.A. Zinke, NuStart

RESPONSE TO ENVIRONMENTAL REPORT REQUEST FOR ADDITIONAL INFORMATION

CONSTRUCTION / PRECONSTRUCTION IMPACT SEPARATION PER 10 CFR 51.45(c)

NRC Review of the BLN Environmental Report

NRC Environmental Category: GENERAL

NRC RAI NUMBER: 10 CFR 51.45(c)

Distinguish between the environmental impacts of construction activities (as defined in 10 CFR 50.10(a) or in 10 CFR 51.4) at the site and the cumulative impact of preconstruction and construction activities. Interim NRC staff guidance concerning this evaluation is available in COL/ESP-ISG-4, available at http://www.nrc.gov/reading-rm/doc-collections/isg/col-esp-isg-4.pdf on the NRC's public Web site.

BLN RESPONSE:

The BLN Combined License Application (COLA) Applicant's Environmental Report will be revised to include two new sections that address the separation of construction and preconstruction impacts and the cumulative impacts associated with the construction activities at the BLN site and other locations within the BLN region.

The new ER Section 4.7 is provided to satisfy the NRC Information and Data Needs on cumulative impacts as identified in NUREG-1555, Environmental Standard Review Plan (ESRP) 4.7, 2007 Draft. (It is noted that the remainder of the BLN ER conforms to the guidance provided in the October 1999 revision to NUREG-1555, unless otherwise noted.) Section 4.7 identifies the BLN region as the geographic area that is used in the consideration of cumulative impacts for this project. TVA is aware of one federal, non-federal, or private project within the 50-mile radius that defines the BLN region, that could potentially involve cumulative impacts with the construction at the BLN site. As discussed in ER Section 4.7 and Subsection 2.5.1.2.1, this project, the realignment of Redstone Arsenal under the Base Realignment and Closure Act of 2005 (BRAC), is expected to be completed prior to BLN construction commencement; consequently, cumulative impacts from this project are expected to be SMALL.

ER Section 4.7 also addresses cumulative impacts associated with the construction activities for the BLN project itself in relation to existing projects in the region. This section provides the clarification that the cumulative impacts discussed in Section 4.7 are the same as those discussed in greater detail throughout ER Sections 4.1 through 4.6, since those sections account for the stresses and conditions in the region resulting from existing projects.

In accordance with 10 CFR 51.45(c), the ER Section 4.8 will be added to address the separation of estimated construction and preconstruction environmental impacts for the purpose of assessing impacts attributable specifically to the construction of the structures, systems, or components (SSCs) as defined in 10 CFR 50.10. In order to divide the impacts construction and preconstruction activities for the purposes of ER Section 4.8, TVA performed a simplified calculation to determine the percent of activities that are safety-related and the percent that are non-safety-related, and used those percentages as a surrogate for the percent of impacts that are attributable to construction activities and preconstruction activities. TVA realizes that the scope of construction as defined in the seven criteria of 10 CFR 50.10(a)(1) is somewhat broader than safety-related activities, and therefore the analysis in ER section may tend to slightly overestimate the impacts due to preconstruction activities and underestimate the impacts of construction activities. However, a precise estimate of the percent of activities that fall within the scope of 50.10(a)(1) is not available, whereas TVA does a basis for the labor estimates of those activities that are safety-related. Since the difference between "safety-related" activities and 50.10 "construction" activities is relatively small with respect to the determination of environmental impacts, TVA believes that the

percentage of safety-related activities provides a useful "order of magnitude" estimate of the impacts of the 50.10 construction activities.

Lastly, ER Table 4.6-1 will be revised to provide minor reformatting, grammatical, and editorial changes as follows:

- Shorten the descriptions of several of the 14 Potential Environmental Impacts to reduce the amount of space required for the repetitive header rows for this table. Only the table headers for the impact descriptions are changed; the environmental impacts are unchanged.
- Change the "Impact Description or Activity" for Subsections 4.2.1 and 4.2.3 to reflect changes identified in the TVA response to NRC Sufficiency Comments ER04, ER11, and ER43 – 45, in the referenced TVA letter dated May 2, 2008. The changes to Subsection 2.4.3 indicated in the May 2, 2008 letter are further changed to correct grammatical errors.
- Change "Specific Measures and Controls" (1) for Subsection 4.2.3, to reflect the changes identified in the TVA response to NRC Sufficiency Comments ER04, ER11, and ER43 – 45, in the referenced TVA letter dated May 2, 2008.
- Change impact levels for the following ER Sections to agree with the more detailed impact assessment in the text sections of Chapter 4, as follows:
    - Section 4.4.1, Physical Impacts: Under "Noise," changed from "S" to "S-M"
    - Section 4.4.1, Physical Impacts: Under "Traffic," identify "M-L" impact (Note: In Table 4.8-1, these traffic impacts are appropriately addressed under Subsection 4.4.2, Social and Economic Impacts.)
- Make minor editorial changes to correct spelling, as follows:
    - Section 4.3.2, Impact Description or Activity #1: change "store water" to "stormwater"
    - Section 4.3.2, Specific Measures and Controls (2, 3, and 4): change "iand" to "and"
    - Section 4.4.2, Impact Description or Activity #1: change "shuttling" to "shuttle"
    - Section 4.4.2, Impact Description or Activity #4: change "intrastructure" to "infrastructure"
    - Section 4.4.2, Impact Description or Activity #8: delete this impact. It is a duplicate of Impacts 2 and 3, and is addressed by Specific Measures and Controls for (2) and (3)

References:

1. Letter from Andrea L. Sterdis (TVA) to NRC Document Control Desk, "Response to Environmental Report (ER) Sufficiency Review Comment," dated May 2, 2008. [ML081270657]

This response is PLANT-SPECIFIC.

ASSOCIATED BLN COL APPLICATION TEXT CHANGES:

1. Change COLA Part 3, Environmental Report, Section 4.6, first paragraph, as follows:

This section summarizes the principal adverse environmental impacts of construction of BLN and the associated measures and controls to limit these impacts. A modified Leopold Matrix

has been ~~constructed~~ developed to assess the cause-and-effect relationships between potential environmental disturbances and the corresponding affected environmental receptors/resources (Table 4.6-1).

2. Change COLA Part 3, ER Table 4.6-1, to provide minor reformatting changes and to update the changes presented in the response to NRC sufficiency review questions ER04, ER11, and ER43 – ER45, Change #11, in TVA's letter dated May 2, 2008 (Reference 1), as shown on the following pages.

TABLE 4.6-1 (Sheet ## of 8)
SUMMARY OF MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

ENVIRONMENTAL RESOURCES (Section Reference)		Potential Environmental Impacts and Significance Levels														Impact Description or Activity	Specific Measures and Controls
		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.1	**Land-Use Impacts**																
4.1.1	The Site and Vicinity		S			S			S-M							1. Construction of new buildings and impervious surfaces 2. Ground-disturbing activities, including grading and re-contouring 3. Removal of existing vegetation 4. Removal of hazardous wastes/materials 5. Stockpiling of soils on-site 6. Disposition of dredge materials and use of borrow material	(1) Land has already been dedicated as the site for Bellefonte Units 1 and 2 and much of the site has been previously disturbed. No additional land is needed to complete construction of BLN. (1 and 2) Limit ground disturbances to the smallest amount of area practical to construct and maintain the units. (1 and 2) Conduct ground-disturbing activities in accordance with regulatory and permit requirements; use adequate erosion control measures to minimize impacts. (3) Limit vegetation removal to the area within the BLN site designated for construction activities. (4) Removal of hazardous wastes/materials through training and rigorous compliance with applicable regulations. (5) Restrict soil stockpiling and reuse to designated areas on the BLN site. (6) Use BMPs and minimize footprint to the degree feasible. (6) Placement of dredge materials above the 500-year flood elevation.

TABLE 4.6-1 (Sheet ## of 8)
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		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.1.2	Transmission Corridors and Off-site Areas		S			S										1. There are no new transmission corridors to be sited nor lines to be constructed as part of this project. Construction power is to be provided from existing on-site 161-kV switchyard.	(1) Apply TVA's Sensitive Area Review (SAR) process (as described in the transmission section of the ER), re-clear the existing line corridors as needed and proceed to re-establish the normal cycle of maintenance on the existing 500-kV and 161-kV lines. (1) Limit vegetation removal and construction activities to corridor, and to fall and winter to avoid nesting activities. (1) Restrict sites regarding access to corridor for construction equipment. (1) Minimize potential spills of hazardous wastes/ materials through training and rigorous compliance with applicable regulations. (1) Minimize potential impacts through avoidance, and compliance with permitting requirements and best management practices.
4.1.3	Historic Properties		S						S							1. Erosion and ground-disturbing activities on the BLN site, as well as activities to bring the de-energized portions of the existing transmission lines into the normal maintenance cycle.	(1) Conduct cultural resource surveys, including subsurface sampling prior to initiating ground-disturbing activities to identify buried historic, cultural, or paleontological resources. (1) Consult with State Historic Preservation Office if a cultural resource is discovered. (1) Halt work if a potential historic, cultural, or paleontological resource is discovered.

TABLE 4.6-1 (Sheet ## of 8)
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		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.2	**Water-Related Impacts**																
4.2.1	Hydrologic Alterations						S					S				1. ~~Construction or modification of~~ Maintenance activities on water intake structures could result in minor hydrologic changes.	(1) Adhere to applicable regulations and permits.
4.2.2	Water-Use Impacts		S	S			S						S			1. Water used in dust suppression would have a small effect on water usage 2. Increased worker population would result in a small increase in water use 3. Water drawn from reservoir for plant cooling	(1 and 2) No measures or controls are necessary because impacts are expected to be too small to warrant consideration of any mitigation measures.

TABLE 4.6-1 (Sheet ## of 8)
SUMMARY OF MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

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		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.2.3	Water-Quality Impacts		S			S	S		S			S				~~1. Potential construction or modification of barge facility or intake and discharge structures, or dredging of Tennessee River at the BLN vicinity wastes or materials~~ 1. Potential maintenance or refurbishment of the barge facility, and maintenance dredging of the intake canal, blowdown diffuser, and Tennessee River adjacent to the BLN site 2. Potential erosion, and sediment and stormwater runoff from construction activities into water bodies 3. Potential minor spills of hazardous materials	(1) ~~Install coffer dams or use other standard engineering~~ Use of best management practices in addition to TVA, USACE and ADEM controls to protect affected water bodies. (2) Install stormwater drainage system at construction sites and stabilize disturbed soils. (2) Use best management practices to minimize erosion and sedimentation. (3) Use best construction practices to maintain equipment, and prevent spills and leaks. (3) Invoke BLN spill prevention control and countermeasure plan for construction practices.

TABLE 4.6-1 (Sheet ## of 8)
SUMMARY OF MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

ENVIRONMENTAL RESOURCES (Section Reference)		Potential Environmental Impacts and Significance Levels														Impact Description or Activity	Specific Measures and Controls
		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.3	**Ecological impacts (i.e., impacts on the physical environment)**																
4.3.1	Terrestrial Ecosystems	S	S			S			S		M		S			1. Clearing and grading and habitat loss: animals, such as birds and mammals, displaced from the construction site; less mobile animals killed 2. Wildlife startled or frightened away by construction noises 3. Potential impacts from bird collisions with manmade structures (cranes, buildings) during construction 4. Release of hazardous materials or wastes 5. Construction of residences and facilities to support increased worker population 6. Construction activities disturb wetlands	(1) Limit clearing to the smallest amount of area practical to construct and maintain the corridor (1) Use established procedures for minimizing erosion or sediment deposition on terrestrial habitat. (2) Schedule some construction activities for periods when they do not affect birds or the terrestrial ecosystem. (3) Impact is very small and no reasonable mitigation measures have been identified (4) Use best construction practices to maintain equipment and prevent spills and leaks. (5) Comply with zoning ordinances to prevent/limit effects of new housing construction on habitat. (6) Consult with U.S. Army Corps of Engineers regarding compensatory mitigation and reparation of any applicable wetlands permitting requirements.

TABLE 4.6-1 (Sheet ## of 8)
SUMMARY OF MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

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		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.3.2	Aquatic Ecosystems	S	S			S	S					S	S		S	1. Potential impacts to surface water from ~~store water~~ stormwater pollution and spills 2. Erosion and runoff into nearby water bodies 3. Potential impacts to surface-water from increased sediment load during construction 4. Temporarily degraded aquatic habitat due to construction near the Tennessee River or wetlands.	(1) Develop and implement a construction stormwater pollution prevention plan. (2) Invoke spill prevention control and countermeasure plan for construction activities. (2 and 3) Implement erosion and sediment control plans that incorporate recognized best management practices. (2, 3, and 4) Install appropriate barriers iand use best management practices to protect river prior to construction.

TABLE 4.6-1 (Sheet ## of 8)
SUMMARY OF MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

ENVIRONMENTAL RESOURCES (Section Reference)		Potential Environmental Impacts and Significance Levels														Impact Description or Activity	Specific Measures and Controls
		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.4	**Socioeconomic Impacts (i.e., impacts on the human environment)**																
4.4.1	Physical Impacts	S-M		S	M-L					S					S	1. Potential temporary and limited noise impacts to workers 2. Potential for worker accidents 3. Increased air and dust emissions from construction equipment 4. Increased debris to existing landfills	(1) Make public announcements or give prior notification of atypically loud construction activities. (1, 2, and 3) Train and appropriately protect BLN employees and construction workers to reduce the risk of potential exposure to noise, dust, and exhaust emissions. (1, 2, and 3) Manage concerns from workers or adjacent residents or visitors on a case-by-case basis through an employee-concerns resolution program. (2) Use dust control measures such as watering, stabilizing disturbed areas, covering trucks. (2) Provide on-site services for emergency first aid, and conduct regular health and safety monitoring. (3) Provide appropriate job training to construction workers. (3) Prepare a dust suppression plan and water unpaved roads and construction areas. (4) Establish procedures for, and perform audits to verify, waste disposal according to applicable regulations such as the Resource Conservation and Recovery Act (RCRA) (4) Establish a waste minimization program

TABLE 4.6-1 (Sheet ## of 8)
SUMMARY OF MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

ENVIRONMENTAL RESOURCES (Section Reference)		Potential Environmental Impacts and Significance Levels														Impact Description or Activity	Specific Measures and Controls
		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.4.2	Social and Economic Impacts				M-L				S				S-L			1. Traffic congestion impacts in the vicinity of BLN due to increased traffic during peak construction period 2. Potential short-term housing shortage 3. Potential for increased housing construction impacts 4. Potential short-term ability of ~~intrastructure~~ infrastructure and schools to accommodate influx of students without additional facilities and teachers 5. Potential for increased traffic accidents with increased construction traffic 6. Beneficial impact on economy 7. Beneficial impact on Jackson County tax revenue ~~8. Impact on local housing~~	(1) Develop traffic-control mitigation plan. (1) Establish centralized parking areas away from site and shuttl~~ing~~e construction workers to the site. (1) Install traffic control lighting. (1) Stagger shifts, encourage car pooling, and time deliveries to avoid shift change or commute times. (1) Erect signs alerting drivers of construction and potential for increased construction traffic. (2) Anticipate that any housing shortages are mitigated through new construction in anticipation of arrival of construction workforce. (3) Comply with land-use ordinances to prevent over-crowding and promote "smart growth." (4) Fund additional community facilities and infrastructure, police, and fire protection through increased revenues that result from the large construction project. (5) Use procedures and employee training program to reduce potential for traffic accidents. (6) Impact is beneficial and does not necessitate mitigation. (7) Impact is beneficial and does not necessitate mitigation.
4.4.3	Environmental Justice Impacts				S				S	S			S			1. No disproportionably high or adverse impacts identified	(1) No mitigation measures required beyond those listed above.

TABLE 4.6-1 (Sheet ## of 8)
SUMMARY OF MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

ENVIRONMENTAL RESOURCES (Section Reference)		Potential Environmental Impacts and Significance Levels														Impact Description or Activity	Specific Measures and Controls
		Noise	Erosion	Dust	Traffic	Effluents and Wastes	Surface Water ~~Impacts~~	Groundwater ~~Impacts~~	Land-Use Prot/Rest.	Water-Use Prot/Rest.	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomics	Rad Exp to Constr. Wkr.	Other Site-Specific		
4.5	**Radiation Exposure to Construction Workers**																
4.5.1	Worker Impacts													S		1. Actions to protect construction workers while the first unit is operating and the second is being built	(1) Take measures such as monitoring workers, providing radiation worker training, and developing work plans that minimize worker radioactive exposure.

3. Change COLA Part 3, ER Chapter 4, by adding NEW Sections 4.7 and 4.8, including Table 4.8-1, as follows:

4.7 CUMULATIVE IMPACTS RELATED TO CONSTRUCTION ACTIVITIES

In accordance with NUREG-1555, Environmental Standard Review Plan (ESRP) 4.7, this section summarizes potential cumulative environmental impacts associated with the construction of the BLN facility.

4.7.1 CUMULATIVE ENVIRONMENTAL IMPACTS

This subsection has identified the cumulative impacts associated with the construction of BLN. As identified in NUREG-1555, ESRP 4.7, cumulative impact is defined as:

> The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

As identified in NUREG-1555, ESRP 4.7, the anticipated magnitude of the potential cumulative impacts was surmised from the following information:

- Identification of the geographic area to be considered in evaluating cumulative impacts.
- Identification of past, present, and reasonably foreseeable federal, nonfederal, and private actions that could have meaningful cumulative impacts with the proposed action.
- Information on cumulative impacts of relevant actions within the identified geographic area.

4.7.2 IDENTIFICATION OF CUMULATIVE IMPACTS ASSOCIATED WITH THE PROPOSED ACTION AND PAST AND PRESENT ACTIONS

The U.S. Environmental Protection Agency (EPA) provides the following guidance in identifying and determining cumulative impacts: Cumulative impacts can affect a broad array of resources and ecosystem components. In addition to considering the biological resources that are the staple of National Environmental Policy Act (NEPA) analysis, examples of other resources that should be considered include socioeconomic services and issues, human health, recreation, quality of life issues, and cultural and historical resources (Reference 1).

Cumulative impacts associated with construction of the BLN in conjunction with past and present actions are listed in Table 4.6-1. The table provides a summary of cumulative impacts associated with construction of BLN and impacts in the region due to pre-existing human activities. For example, with respect to water use and aquatic impacts, the analysis in the previous subsections of Section 4 already accounts for the changes in the Tennessee River due to the construction and operation of TVA's dams, including the Guntersville Reservoir. This analysis uses the NRC's three-level standard of significance levels for each element (SMALL, MODERATE, or LARGE). The use of these significance levels provides a characterization of the

cumulative impacts on the region's ecological resources, socioeconomic resources, human health, recreation, quality of life issues, and cultural and historical resources that are associated with constructing the BLN.

Section 4.0 defines the significance levels that were used in the evaluation of environmental impacts resulting from BLN construction. The significance level of potential impact to each resource (i.e., SMALL, MODERATE, or LARGE) is assigned consistent with the criteria that NRC established in 10 CFR Part 51, Appendix B, Table B-1, Footnote 3. The impact categories evaluated in this section are consistent with those used in the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437, Volumes 1 and 2.

The potential impacts resulting from construction of two new nuclear units at the BLN site are evaluated in Sections 4.1 through 4.5, in light of the pre-existing conditions in the region caused by past and present human actions. For the duration of the construction of the proposed action, the evaluation took into account the potential impacts from factors known or likely to affect the environment. This included considering conditions at the site and surrounding region from past and present human activities.

For most impact areas, TVA anticipates the potential cumulative impacts resulting from construction to be generally SMALL, and additional mitigation would not be warranted. However, several impacts from construction could result in a SMALL to MODERATE impact, or in one case, a temporary MODERATE to LARGE impact. In these cases, mitigation measures may be warranted, as discussed in the applicable impact evaluation summaries in Sections 4.1 through 4.5.

4.7.2 IDENTIFICATION OF CUMULATIVE IMPACTS ASSOCIATED WITH FUTURE KNOWN FEDERAL, NON-FEDERAL, AND PRIVATE ACTIONS

The evaluation of cumulative impacts associated with the BLN project identifies the 50-mi. radius BLN region as the geographic area to be considered in evaluating cumulative impacts. The region surrounding the BLN site comprises a 50-mi. radius that includes all or part of 25 counties in three states (10 in Alabama, 7 in Georgia, and 8 in Tennessee). Subsection 2.2.3 provides a description of the region while Table 2.2-1 provides a tabulation of areas within the region, organized by land use category.

TVA's evaluation of cumulative impacts identified only one other scheduled major project within the BLN region with the potential for cumulative impacts with the construction of the BLN. As part of the Base Realignment and Closure Act of 2005 (BRAC), Redstone Arsenal, located at the periphery of the 50-mi. BLN region, is to be realigned (Subsection 2.5.1.2.1). It is estimated that this realignment will involve between 10,000 and 16,000 new direct and indirect jobs during construction, and approximately 4870 new direct and indirect jobs are expected in the surrounding four-county region during operation of Redstone Arsenal after realignment. Because BRAC construction is expected to be completed prior to the BLN construction commencement date of mid-2013, there should be no competition in the hiring of a BLN construction workforce due to BRAC, and cumulative impacts of these projects are expected to be SMALL.

Additionally, since the Redstone Arsenal is located at the periphery of the 50-mile BLN region, construction at and operation of the Redstone Arsenal should have little or no environmental impact (including socioeconomic impact) in the vicinity of BLN. Therefore, the cumulative impacts of BLN and Redstone Arsenal should not be significantly different than the impacts discussed in Section 4.7.1.

4.7.3 REFERENCES

1. U.S. Environmental Protection Agency (EPA), Office of Federal Activities (2252A), Consideration of Cumulative Impacts in EPA Review of NEPA Documents, EPA 315-R-99-002/May 1999.

4.8 SEPARATION OF "CONSTRUCTION" AND "PRECONSTRUCTION" IMPACTS

[Note: In the context of this ER section, the term "construction" has two decidedly different meanings. When printed in italics, the term *construction* is referring to the specific term that is defined in 10 CFR 50.10, as discussed below. When italics are not used, the term "construction" is referring to the more commonly used general term that includes the sum total of the activities necessary to build the two-unit nuclear plant, including the associated supporting structures and facilities.]

In addition to the cumulative impacts attributable to the construction of the entire BLN facility that are summarized in Table 4.6-1, a breakdown or separation of estimated "*construction*" and "preconstruction" environmental impacts is provided in Table 4.8-1 for the purpose of assessing impacts attributable specifically to the *construction* of structures, systems, or components (SSCs) as defined in 10 CFR 50.10. The remaining BLN construction activities can be considered to be either "preconstruction" or "other than *construction*" under the definition of *construction* in 10 CFR 50.2.

Table 4.8-1 provides estimates of the percentage of impacts attributable to *construction* and to "preconstruction," as well as a summary of the basis for the estimates. In order to divide the impacts *construction* and preconstruction activities for the purposes of Table 4.8-1, TVA performed determined the percent of activities that are safety-related and the percent that are non-safety-related, and used those percentages as a surrogate for the percent of impacts that are attributable to *construction* activities and preconstruction activities. The scope of *construction* as defined in 10 CFR 50.10(a)(1) is somewhat broader than safety-related activities, and therefore the analysis in Table 4.8-1 may tend to slightly overestimate the impacts due to preconstruction activities and slightly underestimate the impacts of *construction* activities. However, a precise estimate of the percent of activities that fall within the scope of 10 CFR 50.10(a)(1) is not available, whereas TVA does have a basis for the labor estimates of those activities that are safety-related. Since the difference between "safety-related" activities and 50.10 *construction* activities is relatively small with respect to the determination of environmental impacts from a passive plant such as the AP1000, TVA believes that the percentage of safety-related activities provides a useful "order of magnitude" estimate of the impacts of the 50.10 *construction* activities.

The estimated *construction*-related impacts presented in the table were based primarily on two factors, namely the area associated with the *construction* of safety-related SSCs and the labor hours associated with the *construction* of safety-related SSCs. Information related to these two factors is provided as follows:

Construction Area — The BLN site consists of approximately 1600 contiguous ac., exclusive of off-site linear facilities (discharge pipelines, electric transmission line corridors, and rail corridors). The total estimated area to be developed for the BLN is estimated to be approximately 600 ac., including approximately 400 ac. disturbed by previous construction activities for Units 1 and 2 (exclusive of the electric transmission lines) and approximately 200 ac. affected by construction of Units 3 and 4. Of these developed areas, approximately 50 ac. are expected to be developed for safety-related SSCs (25 ac. each for BLN 1 and BLN 2). The area that is

expected to be developed for the *construction* of safety-related SSCs therefore represents approximately 8 percent of the total area that is expected to ultimately be developed (excluding electric transmission lines). For the purposes of this assessment, the impacted area associated with safety-related SSCs is considered to be less than 10 percent.

Labor Hours	Preliminary construction estimates for all phases of development of two AP1000 units on a greenfield site concluded that the estimated labor hours associated with the *construction* of SSCs is approximately 36 percent of the total labor hours associated with the development of the entire two-unit plant site. Adjusting the greenfield site labor estimate to account for the preconstruction work that has already been completed at the BLN site (i.e., site clearing/grading, dredging, intake and discharge piping and structures, and cooling towers complete), it is estimated that the total labor hours associated with the *construction* of SSCs at BLN would account for approximately 40 percent of the total labor hours remaining to complete the development of the two-unit BLN site.

Table 4.8-1 (Sheet # of 3)
Summary of Construction-and Preconstruction-Related Impacts for Safety-Related Structures, Systems, or Components

Section Reference	Potential Impacts and Significance [a]	Estimated Impacts (%)		Basis of Estimate
		Construction [b]	Preconstruction	
ER Section 4.1 Land-Use Impacts				
ER Subsection 4.1.1 The Site and Vicinity	S – Erosion S – Effluents and Wastes S-M – Land-Use Protection/Restoration	10	90	Estimates are based on the area of land use that will be dedicated to safety-related structures, systems, or components (SSCs) and the assumption that the construction of SSCs will occur on no more than approximately 50 acres (25 acres each for BLN Units 3 and 4) of the project area being developed (that is, 600 acreas, excluding off-site electric transmission lines) (8%, restated as <10%)
ER Subsection 4.1.2 Transmission Corridors and Off-Site Areas	S - Erosion S - Effluents and Wastes	0	100	Neither transmission corridors nor any other off-site areas associated with construction of BLN is included in the definition of construction of SSCs.
ER Subsection 4.1.3 Historic Properties	S - Erosion S - Land-Use Protection/Restoration	0	100	The impact of historic properties will apply only to preconstruction activities, because they will be identified prior to land clearing, grading, installation of drainage, erosion and other environmental mitigation measures, and construction of temporary roads and laydown areas.
ER Subsection 4.2 Water-Related Impacts				
ER Subsection 4.2.1 Hydrologic Alterations	S - Surface Water S – Aquatic Ecosystem	10	90	Estimates are based on the area of land use that will be dedicated to safety-related structures, systems, or components (SSCs) and the assumption that the construction of SSCs will occur on no more than approximately 50 acres (25 acres each for BLN Units 3 and 4) of the project area being developed (that is, 600 acreas, excluding off-site electric transmission lines) (8%, restated as <10%)
ER Subsection 4.2.2 Water-Use Impacts	S - Erosion S - Dust S - Surface Water S - Socioeconomics	10	90	Estimates are based on the area of land use that will be dedicated to safety-related structures, systems, or components (SSCs) and the assumption that the construction of SSCs will occur on no more than approximately 50 acres (25 acres each for BLN Units 3 and 4) of the project area being developed (that is, 600 acreas, excluding off-site electric transmission lines) (8%, restated as <10%)
ER Subsection 4.2.3 Water Quality Impacts	S - Erosion S - Effluents and Wastes S - Surface Water S - Land-Use Protection/Restoration S - Aquatic Ecosystem	10	90	Estimates are based on the area of land use that will be dedicated to safety-related structures, systems, or components (SSCs) and the assumption that the construction of SSCs will occur on no more than approximately 50 acres (25 acres each for BLN Units 3 and 4) of the project area being developed (that is, 600 acreas, excluding off-site electric transmission lines) (8%, restated as <10%)

Table 4.8-1 (Sheet # of 3)
Summary of Construction-and Preconstruction-Related Impacts for Safety-Related Structures, Systems, or Components

Section Reference	Potential Impacts and Significance [a]	Estimated Impacts (%)		Basis of Estimate
		Construction [b]	Preconstruction	
ER Subsection 4.3 Ecological Impacts (i.e., impacts on the physical environment)				
ER Subsection 4.3.1 Terrestrial Ecosystems	S - Noise S - Erosion S - Effluents and Wastes S - Land-Use Protection/Restoration M - Terrestrial Ecosystem S - Socioeconomics	0	100	Ecological impacts will occur during preconstruction activities and mobile wildlife species are expected to vacate the site until construction is complete. Impacts to native plants will occur during land clearing and preparation.
ER Subsection 4.3.2 Aquatic Ecosystems	S - Noise S - Erosion S - Effluents and Wastes S - Surface Water S - Aquatic Ecosystem S - Other Site-Specific	40	60	Estimates are based on the percent of total project labor hours that will be dedicated to the construction of safety-related structures, systems, or components (SSCs), all of which will be in the power block areas for BLN (approximately 40%)
ER Subsection 4.4 Socioeconomic Impacts (i.e., impacts on the human environment)				
ER Subsection 4.4.1 Physical Impacts	S-M -Noise S - Dust S - Water-Use Protection/Restoration S - Other Site-Specific	25	75	Most perceptible noise impacts at off-site locations will occur during the most intense operations in the power block area and will include pile driving of SSCs. Air emissions will occur in the vicinity of the SSCs (power block area) during construction. Estimates are based on the average of the percent of labor hours dedicated to safety-related structures, systems, or components (SSCs) (35%) and the percent of land dedicated to SSCs (<5%). (Average stated as 20%
ER Subsection 4.4.2 Social and Economic Impacts	M-L - Traffic S - Land-Use Protection/Restoration S-L – Socioeconomics	40	60	Estimates are based on the percent of total project labor hours that will be dedicated to the construction of safety-related structures, systems, or components (SSCs), all of which will be in the power block areas for BLN (approximately 40%)
ER Subsection 4.4.3 Environmental Justice Impacts	S - Traffic S - Land-Use Protection/Restoration S - Water-Use Protection/Restoration	40	60	Estimates are based on the percent of total project labor hours that will be dedicated to the construction of safety-related structures, systems, or components (SSCs), all of which will be in the power block areas for BLN (approximately 40%)

Table 4.8-1 (Sheet # of 3)
Summary of Construction-and Preconstruction-Related Impacts for Safety-Related Structures, Systems, or Components

Section Reference	Potential Impacts and Significance [a]	Estimated Impacts (%)		Basis of Estimate
		Construction [b]	Preconstruction	
	S - Socioeconomics			
ER Subsection 4.5 Radiation Exposure to Construction Workers				
ER Subsection 4.5.1 Worker Impacts	S - Radiation Exposure to Construction Workers	20	80	Estimates are based on 50% of the workforce remaining during the completion of the SSCs for BLN Unit 4 (half of 40%)

Notes:

a) The assigned potential impact significance levels of (S)MALL, (M)ODERATE, or (L)ARGE are based on the assumption that mitigation measures and controls would be implemented.

b) "Construction," as defined in 10 CFR 50.2, "Definitions," refers to the construction of "safety-related structures, systems, or components (SSCs) of a facility."

ATTACHMENTS:

None.