Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

June 4, 2004

10 CFR 54
10 CFR 51

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos.	50-259
Tennessee Valley Authority	)		50-260
			50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2, AND 3 - ADDITIONAL SUPPORT FOR DETERMINATION OF NO NEW AND SIGNIFICANT LICENSE RENEWAL ENVIRONMENTAL INFORMATION

By letter dated December 31, 2003, TVA submitted an application to renew the operating licenses for BFN Units 1, 2, and 3. To assist the Staff in its review of the Environmental Report (ER) contained in the BFN application, the Enclosures provide additional support for the determination of no new and significant license renewal environmental information contained in Section E.5.0 and Attachment E-5 of the ER. Enclosure 1 discusses the process by which TVA determined that there are no environmental issues related to BFN license renewal which are both new and significant. Enclosure 2 summarizes TVA's review of each of the 92 license renewal environmental issues listed in Table B-1 of Appendix B to Subpart A of Title 10 of the Code of Federal Regulations, Part 51.

This letter contains no new commitments.

If you have any questions about this information, please contact Chuck Wilson, Project Manager for BFN License Renewal Environmental Review, at (423) 751-6153 or clwilson@tva.gov.

A105

I declare under penalty of perjury that the foregoing is true and correct. Executed on this fourth day of June 2004.

Sincerely,

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cc: Continued on page 3

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ENCLOSURE 1

DETERMINATION OF NO NEW AND SIGNIFICANT INFORMATION

TVA National Environmental Policy Act (NEPA) Experience

In view of its broad responsibilities for the natural and social welfare of the Tennessee Valley Region, TVA has developed expertise in environmental impact assessment. TVA is the steward of the Tennessee River Watershed and has land management and permitting responsibilities, in addition to those related to economic development and power system operation. TVA produces both programmatic and site-specific NEPA reviews primarily using its internal staff. For example, in 1996 TVA produced a programmatic Environmental Impact Statement (EIS) for its Shoreline Management policy. The Shoreline Management EIS assessed the impacts of proposed shoreline management permitting standards and established a policy on determining how and when to consider allowing residential development on TVA reservoir shorelines. The impacts of these proposed decisions on 30 reservoirs were assessed by the TVA staff. In February 2004, TVA produced a programmatic EIS for the Reservoir Operations Study, which documented the environmental and socioeconomic impacts associated with potential changes to TVA's existing reservoir operations policy and whether they would produce greater public value. TVA also serves as a cooperating agency and independently examines numerous environmental review documents produced by other agencies, especially those produced by the U.S. Army Corps of Engineers and Federal Highway Administration in the TVA region.

TVA Heritage Project

The southeastern United States contains some of the most diverse plant and animal communities on earth. Many of these species are found in the TVA Power Service area, and especially, in the Tennessee River basin. In 1976, TVA established an inventory of endangered, threatened, and rare plants and animals, sensitive geological features, natural communities, natural areas, and other sensitive natural resource features. TVA biologists routinely add new information to the database and exchange data with biologists in the U.S. Fish & Wildlife Service (FWS) and biologists in Natural Heritage Programs in the seven valley states. TVA biologists use information in the database, and their familiarity with the priorities and interests of the other agencies, to ensure that important issues are identified and addressed for TVA projects. Often, early identification reduces the need for formal Endangered Species Act consultations. In light of the large number of federally-listed species in the region, TVA has significant experience in identifying situations where listed species could be affected and formally or informally consulting with FWS. In 1993, the Nature Conservancy presented TVA's Natural Heritage Project with one of its first Outstanding Heritage Program Awards. Conservancy officials said the TVA program provides a unique ecosystem perspective while advancing information management on conservation priorities across the state and region. More recently, the Tennessee Department of Environment and Conservation gave awards to two TVA biologists for their activities relating to rare species.

The responsibility for maintaining the Heritage database falls primarily to a nine member TVA staff: three of whom hold PhDs, four with Master's degrees, and the Project Manager has a Master's degree and many years of first-hand experience. The professional responsibility and credibility of the TVA Heritage staff are highly regarded by their peers in state and federal agencies and academia.

NEPA History and Background of Browns Ferry Nuclear Plant (BFN)

In 1971, a draft environmental statement was prepared by TVA to evaluate the effects on the environment of construction and operation of BFN. The Atomic Energy Commission (AEC), a former regulatory agency of the federal government, since superseded by the Nuclear Regulatory Commission (NRC), participated in the preparation of this three-volume document as a cooperating agency. The draft environmental document was sent to the Council on Environmental Quality and made available to the public for comment on July 14, 1971. Supplements and additions to the draft were sent to the Council and made available to the public for comment on November 8, 1971. When the final document was issued, it was titled as follows: "Final Environmental Statement, Browns Ferry Nuclear Plant, Units 1, 2, and 3." The AEC concluded on August 28, 1972, that this Final Environmental Statement was adequate to support the proposed license to operate the plant. The Final Environmental Statement was sent to the Council and made available to the public on September 1, 1972.

BFN Unit 1 began commercial operation in August 1974, Unit 2 in 1975, and Unit 3 in 1977. Unit 1 has been idled since 1983, and extensive work is required to bring the unit up to current standards. After an extended shutdown beginning in 1985 to review the TVA nuclear power program and to correct significant weaknesses, Unit 2 was recovered and returned to service in May 1991, and Unit 3 was recovered and returned to service in November 1995. Since that time, Units 2 and 3 have performed well, with consistently higher levels of availability and generating capacity than most other nuclear generating units and higher levels than those experienced by these two units before 1985.

Anticipating that it would receive applications for renewal of the operating licenses of a significant portion of existing nuclear power plants, in 1996 the NRC prepared a *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUGEG-1437, to examine the possible environmental impacts that could occur as a result of renewing licenses of individual nuclear power plants under 10 CFR 54. The GEIS, to the extent possible, establishes the bounds and significance of these potential impacts. The analyses in the GEIS encompass all operating light-water reactors. For each type of environmental impact, the GEIS establishes generic findings covering as many plants as possible. The GEIS makes maximum use of environmental and safety documentation from original licensing proceedings and information from state and federal regulatory agencies, the nuclear utility industry, the open literature, and professional contacts. The GEIS identifies 92 environmental issues and reaches generic conclusions on environmental impacts for 69 of those issues that apply to all plants or to plants with specific design or site characteristics. For the remaining 23 issues, further site-specific information is required by the NRC to determine the environmental acceptability of operating license renewal.

In the fall of 2000, TVA began work on a Supplemental Environmental Impact Statement (SEIS) for Operating License Renewal of BFN in Athens, Alabama, which also included consideration of recovering and restarting Unit 1. Renewal of the operating licenses of all three units would allow operation to continue for an additional 20 years past the current (original) 40-year operating license terms which expire in 2013, 2014, and 2016 for Units 1, 2, and 3, respectively. From the outset of this NEPA review, a principal objective was to comprehensively revisit all environmental subject areas to determine if any new and significant information was available since work on the original Environmental Statement had been completed in 1972. Towards this end, the 92 environmental issues listed in the GEIS were revisited as an additional tool for identifying any new and significant information, and some of these issues were subsequently incorporated into the plans for the SEIS to ensure that it would be as comprehensive as possible. A Notice of Intent to prepare the SEIS was published in the February 15, 2001, *Federal Register*, which initiated a public and interagency scoping period from February 15 through March 23, 2001. A public scoping meeting was held on March 6, 2001, near Decatur, Alabama, on the campus of Calhoun Community College. Comments and suggestions received at that meeting and during the scoping period were used to identify the scope of the Draft SEIS.

The Draft SEIS was issued for public and interagency review on December 5, 2001. A copy of the Draft SEIS and a letter were formally transmitted to the United States Environmental Protection Agency (EPA) on December 6, 2001. The Notice of Availability of the Draft SEIS was published in the December 14, 2001, *Federal Register*. The issuance of the Notice of Availability formally opened a 45-day period for receiving public and interagency comments on the Draft SEIS. Copies of the full Draft SEIS or a 28-page Executive Summary of the Draft SEIS were mailed to federal, state, and local officials and agencies, and members of the public, depending on expressed or anticipated interest. Federal agencies to which copies of the Draft SEIS were sent included the Fish and Wildlife Service, Department of the Interior, Army Corps of Engineers, EPA, and NRC. State of Alabama agencies to which copies of the Draft SEIS were sent included the Department of Environmental Management, Department of Economic and Community Affairs, Forestry Commission, Development Office, Department of Transportation, Department of Agriculture and Industries, Department of Conservation and Natural Resources, Department of Health, and the Emergency Management Agency. A second public meeting was held on January 17, 2002, also at Calhoun Community College, to provide the public another opportunity to comment on the Draft SEIS. The public comment period officially closed on January 30, 2002. TVA received comments from 21 people or entities.

Comments received from the public and agency review were considered in completing the Final SEIS, which was issued in March 2002. Comments were received from the EPA and the U.S. Department of the Interior. A Notice of Availability for the Final SEIS appeared in the *Federal Register* on April 5, 2002. To ensure the highest degree of public notice and participation in the NEPA process, TVA also requested comment on the Final SEIS from April 5 to May 6, 2002. TVA addressed the comments provided within this period in its Record of Decision which was published in the June 18, 2002, *Federal Register*. Under the selected alternative, TVA decided to seek to renew the operating licenses of all three units for an additional 20 years past the current (original) 40-year operating license terms as well as to recover and restart Unit 1. Following the publishing of the Record of Decision, significant work began on recovering Unit 1, with the scheduled objective of restarting the unit in 2007.

Environmental Monitoring Programs

TVA has conducted and continues to conduct a number of environmental monitoring programs in the Tennessee River Valley which have applicability to BFN. For example, TVA has conducted extensive sampling of the fish community in the vicinity of BFN and elsewhere in the Wheeler Reservoir, both in monitoring programs conducted specifically for BFN, and as part of TVA's Reservoir Monitoring Program. A total of 60 species has been collected in recent years by various sampling methods, including gill nets, electrofishing, and cove rotenone. Cove rotenone samples were collected annually from 1969 through 1997 as a component of the TVA environmental monitoring program for BFN, to provide a database on the fish community in the vicinity of BFN, and later to serve as a part of a thermal variance monitoring program.

TVA began a program to systematically monitor the ecological conditions of its reservoirs in 1990. Previously, reservoir studies had been confined to assessments to meet specific needs as they arose. Reservoir and stream monitoring programs were combined with TVA's fish tissue and bacteriological studies to form an integrated Vital Signs Monitoring Program. Vital Signs Monitoring activities focus on physical/chemical characteristics of waters and sediments, benthic macroinvertebrate community sampling, and fish assemblage sampling. Fish samples were taken in three areas of Wheeler Reservoir from 1990 through 1995, and again in 1997 and 1999 as part of this monitoring program. Areas sampled included the forebay (area of the reservoir nearest the dam), a mid-reservoir transition station in the vicinity of Tennessee River Mile (TRM) 295.9, an upper-reservoir inflow station at TRM 348, and the Elk River Embayment. (BFN is located on the north shore at TRM 294.0. TRM 0.0 is downstream, where the Tennessee River joins the Ohio River in Paducah, KY.)

Reservoir Fish Assemblage Index (RFAI) ratings are based on fish community structure and function. Also considered in the rating are the percentage of the sample represented by omnivores and insectivores, overall number of fish collected, and the occurrence of fish with anomalies such as diseases, lesions, parasites, deformities, etc. In the fall of 2000, additional (i.e., not on the regular RFAI monitoring schedule) electrofishing and gill net samples were taken at the transition station (TRM 295.9) and a newly-established sampling station for future BFN monitoring at TRM 292.5.

Benthic macroinvertebrates are included in the Vital Signs Monitoring Program. Since 1995, Vital Signs samples have been collected in the late fall/winter (November/December). Depending on reservoir size, as many as three stations are sampled (i.e., inflow, transition, and forebay). In addition to Vital Signs benthic macroinvertebrate monitoring, benthic community sampling in support of BFN thermal variance monitoring was begun in the fall of 2000 and will continue at least through the term of the current permit cycle of five years. Station locations are TRM 296 and TRM 292, upstream and downstream of the BFN diffusers, respectively.

After the year 2000, a team of biologists, including representatives from TVA and state fishery resource agencies in the Tennessee Valley, developed a Sport Fish Index (SFI) to quantify sport fishing quality for individual sport fish species and provide biologists with a reference

point. Comparison of the population sampling parameters and creel results for a particular sport fish species with expectations of these parameters from a high quality fishery (reference conditions) allows for the determination of fishing quality. In recent years, SFI information has been used to describe the quality of the resident sport fishery in conjunction with compliance monitoring, thermal variance requests, and other regulatory issues at TVA generating facilities in Tennessee and Alabama.

In addition to aquatic biota, other relevant TVA environmental monitoring activities applicable to BFN include compliance monitoring of radiological and non-radiological gaseous and liquid effluents. Liquid releases are controlled in compliance with the National Pollution Discharge Elimination System permit, and BFN submits an annual Air Emissions Report to the Alabama Department of Environmental Management. TVA maintains cognizance of state and federal air quality monitoring, largely in conjunction with fossil-fueled power plant emissions. The Radiological Environmental Monitoring Program (REMP), which began in 1973 to assess the impact of BFN operations on the surrounding environs and the general public, is designed to monitor primary pathways for exposure to humans. The REMP includes measurement of direct radiation levels and sampling of fish, shoreline sediment, river water, air particulates, gaseous radioiodine, milk, soil, and food crops.

TVA also routinely conducts various maintenance activities on its thousands of miles of transmission lines, including those connecting BFN. Prior to conducting maintenance activities on specific line segments, the transmission line right-of-way is reviewed by technical specialists in the TVA Regional Natural Heritage and Cultural Resources programs, to identify any resource issues that may occur along the transmission line. These reviews address various aspects and considerations such as wetlands, state-listed and federal-listed threatened and endangered species, archaeological and historic sites and structures, and ecologically significant areas and free-flowing rivers. As explained above, TVA's experts in these areas interface frequently and share data with their counterparts in state and federal governmental agencies.

Collectively, these and other on-going monitoring programs provide TVA with current up-to-date information regarding the environmental health of the Valley, including the BFN environs. These programs have enabled BFN to establish a data continuum from the original Environmental Statement to the present, and further support the bases for delineation of new and significant environmental issues beyond those addressed in the GEIS.

Review of 92 Environmental Issues Listed in the GEIS

Each of the 92 license renewal environmental issues listed in the GEIS and summarized in 10 CFR 51, Subpart A, Appendix B, Table B-1, were reviewed by TVA's various subject matter experts that were involved in preparing the SEIS and the subsequent Environmental Report (ER) submitted by TVA as part of its application for BFN License Renewal. The results of this effort were summarized in Attachment E-5 of the ER, which cross-referenced each of the 92 issues with the sections of the SEIS and/or ER that generally or specifically addressed each item.

In preparation for the NRC/Pacific Northwest National Laboratory BFN site visit on March 30 and 31, 2004, to gather environmental information needed by NRC/PNNL staff in order to prepare a Supplement to the GEIS for BFN License Renewal, TVA revisited each item on the list of 92 issues to explicitly document both the license renewal impacts (separately) and the combined impacts (collectively) of license renewal, Unit 1 recovery and restart, Extended Power Uprate (EPU) of all three units, and various associated activities such as dry cask storage and the use of blended highly-enriched uranium fuel. For license renewal by itself, there is no planned physical modification or refurbishment work necessary to continue operation for an additional 20 years past expiration of the current licenses. This is due to a combination of robust original equipment design and the many testing and maintenance programs (both on-going and being added for the renewed license period) which ensure that deteriorating items are replaced as necessary. Consequently, the environmental impacts of license renewal by itself are minimal, and this is reflected in the attached table, in the column for license renewal impacts.

The first two columns of the attached table contain each of the 92 issues and their corresponding summarized determinations by NRC as to their categorization (i.e., whether the items have been generically addressed or need further site-specific review) and significance (i.e., small, moderate, or large, following the stated definitions in the notes following Table B-1 of Part 51, Subpart A, Appendix B). As described above, the third column contains TVA's evaluation of the impacts of license renewal by itself (i.e., essentially looking forward from the expiration of the current operating licenses). The fourth column contains TVA's evaluation of the combined impacts of current and proposed BFN activities, including license renewal, Unit 1 recovery and restart, EPU, dry cask storage, and using blended highly-enriched uranium in the fuel.

Conclusions

Charged with environmental stewardship of the Tennessee River Valley, TVA has a capable staff of experts in various environmental subject matter areas which regularly work with their peers in academia and interfacing governmental agencies. TVA experts employ rigorous procedures and possess extensive experience necessary to conduct comprehensive environmental reviews, and they make use of TVA's various monitoring programs conducted over the decades to maintain current and consistent knowledge of the valley environs. From the original Environmental Statement in 1972 through the Supplemental EIS for License Renewal in 2002 and the most recent License Renewal ER, TVA has thoroughly analyzed those necessary aspects associated with continuing operations of the BFN units through the renewed license period. Together with revisiting the 10CFR51, Table B-1 listing of license renewal environmental issues as documented below, this comprehensive environmental review process has provided assurance that there are no environmental issues related to BFN license renewal which are both new and significant, pursuant to 10 CFR 51.53 (c)(3)(iv).

ENCLOSURE 2

TVA RESPONSES TO 10CFR51 TABLE B-1 LIST OF 92 LICENSE RENEWAL ENVIRONMENTAL ISSUES

Surface Water Quality, Hydrology, and Use (for all plants)

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
1. Impacts of refurbishment on surface water quality.	1 SMALL. Impacts are expected to be negligible during refurbishment because best management practices will be employed to control soil erosion and spills.	Not applicable (no refurbishment is needed for license renewal).	Reference SEIS § 4.3.6.1. Unit 1 recovery will involve minor temporary impacts associated with surface water runoff. Best management practices and compliance with state permit requirements will minimize potential impacts. Reference ER § E.4.4. Since the plant operates in compliance with NPDES regulatory limits, no significant impacts are expected by the plant waste heat on dissolved oxygen and eutrophication in Wheeler Reservoir (over the original 3-unit operation).
2. Impacts of refurbishment on surface water use.	1 SMALL. Water use during refurbishment will not increase appreciably or will be reduced during plant outage.	Not applicable (no refurbishment is needed for license renewal).	Reference ER § E.4.15. No significant change in water usage is expected during Unit 1 recovery. No effect from EPU.
3. Altered current patterns at intake and discharge structures.	1 SMALL. Altered current patterns have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.	Reference ER § E.4.1. The intake structure and discharge diffusers are located and designed to limit current pattern changes in the vicinity of the plant. To date, no significant adverse environmental impacts from altered current patterns have been identified.	Reference ER § E.4.1. Minor increases in water use from EPU and Unit 1 recovery (over the original 2-unit and 3-unit operations).
4. Altered salinity gradients.	1 SMALL. Salinity gradients have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.	Not applicable. BFN is located on interior nonsaline (fresh) waters, not near estuaries.	No adverse salinity effects are expected from EPU or Unit 1 recovery.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
5. Altered thermal stratification of lakes.	1 SMALL. Generally, lake stratification has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term.	Reference ER § E.4.4. Unlike the current patterns in Issue No. 3 above, the weakly stratified conditions of the reservoir are locally disturbed by the intake and discharge structures. However, they are reestablished as the flow moves downstream of the plant. Therefore, no significant impacts.	Reference ER § E.4.4. Only minor localized changes in thermal stratification result from EPU and Unit 1 recovery (over original 3-unit operation).
6. Temperature effects on sediment transport capacity.	1 SMALL. These effects have not been found to be a problem at nuclear power plants and are not expected to be a problem during the license renewal term.	Reference ER § E.4.4. Operation of BFN has not noticeably altered benthic topography or required dredging. The only noticeable sediment accumulation has been inside the diffuser pipes.	Reference ER § E.4.4. EPU and Unit 1 recovery resulted in minor thermal changes to Wheeler Reservoir. No adverse effects are expected to the benthic macroinvertebrate community structure in the vicinity of BFN from EPU or Unit 1 recovery.
7. Scouring caused by discharged cooling water.	1 SMALL. Scouring has not been found to be a problem at most operating nuclear power plants and has caused only localized effects at a few plants. It is not expected to be a problem during the license renewal term.	Reference ER § E.4.4. No significant scouring or deposition in vicinity of discharge. Diffuser design limits potential effects.	Reference ER § E.4.4. Minor increases in discharge water from EPU and Unit 1 recovery (over the original 2-unit and 3-unit operations).
8. Eutrophication	1 SMALL. Eutrophication has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term.	Reference ER § E.4.4. Large, highly productive riverine reservoir with short hydraulic residence time. Therefore, no risk of significant impacts.	Reference ER § E.4.4. Reservoir modeling indicates minor effects from EPU and Unit 1 recovery on temperature, dissolved oxygen, and algal biomass (see ER Table E.4-6).
9. Discharge of chlorine or other biocides.	1 SMALL. Effects are not a concern among regulatory and resource agencies and are not expected to be a problem during the license renewal term.	Reference SEIS § 4.2.6.2 and § 4.3.6.2. Main condenser cooling water is not chlorinated; biocide discharges limited to smaller coolant streams. Regulated by NPDES permit and other provisions of the CWA to protect water quality.	Reference SEIS § 4.2.6.2 and § 4.3.6.2. EPU and Unit 1 recovery involve minor increases in biocide discharges.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
10. Discharge of sanitary wastes and minor chemical spills.	1 SMALL. Effects are readily controlled through NPDES permit and periodic modifications, if needed, are not expected to be a problem during the license renewal term.	Reference ER § E.4.6 and E.4.7 and SEIS § 4.2.6.2 and § 4.3.6.2. Regulated by NPDES permit and other provisions of the CWA.	Reference ER § E.4.6 and E.4.7 and SEIS § 4.2.6.2 and § 4.3.6.2. EPU and Unit 1 recovery involve minor changes in sanitary wastes and other minor discharges.
11. Discharge of other metals in wastewater.	1 SMALL. These discharges have not been found to be a problem at operating nuclear power plants with cooling-tower-based heat dissipation systems and have been satisfactorily mitigated at other plants. They are not expected to be a problem during the license renewal term.	No metals are added by BFN and no changes are being contemplated. Any discharge of metals in the future would require a permit modification and effluent limitation.	No metals additions will result from EPU and Unit 1 recovery.
12. Water use conflicts (plants with once-through cooling systems).	1 SMALL. These conflicts have not been found to be a problem at operating nuclear power plants with once-through heat dissipation systems.	Reference ER § E.4.1, E.4.5-8, and E.4.15. Consumptive use small relative to reservoir. Growth in consumptive use over next 30 years will not reduce minimum flows past BFN.	Reference ER § E.4.1, E.4.5-8, and E.4.15. Minor increases in water use from EPU and Unit 1 recovery (over the original 2-unit and 3-unit operations).
13. Water use conflicts (plants with cooling ponds or cooling towers using make-up water from a small river with low flow).	2 SMALL OR MODERATE. The issue has been a concern at nuclear power plants with cooling ponds and at plants with cooling towers. Impacts on in-stream and riparian communities near these plants could be of moderate significance in some situations. See § 51.53 (c) (3) (ii) (A).	Reference ER § E.4.1, E.4.5-8, and E.4.15. Consumptive use small relative to reservoir. Growth in external consumptive use over next 30 years will not reduce minimum flows past BFN.	Reference ER § E.4.1, E.4.5-8, and E.4.15. Minor increases in water use from EPU and Unit 1 recovery (over the original 2-unit and 3-unit operations).

Aquatic Ecology (for all plants)

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
14. Refurbishment.	1 SMALL. During plant shutdown and refurbishment there will be negligible effects on aquatic biota because of a reduction of entrainment and impingement of organisms or a reduced release of chemicals.	Not applicable (no refurbishment is needed for license renewal).	Addressed in SEIS § 3.10.1. The balanced indigenous population of aquatic organisms found in the vicinity of BFN will not be affected during any plant outage, and no adverse effects are expected from EPU or Unit 1 recovery.
15. Accumulation of contaminants in sediments or biota.	1 SMALL. Accumulation of contaminants has been a concern at a few nuclear power plants but has been satisfactorily mitigated by replacing copper alloy condenser tubes with those of another metal. It is not expected to be a problem during the license renewal term.	No significant impacts are anticipated. BFN has replaced its copper-bearing condenser tubes with stainless steel on all three units. The Unit 2 and Unit 3 condenser tubes were changed to stainless steel AL-6XN and Unit 1 is now UNS S44660 "Sea-Cure" superferritic stainless steel.	No adverse effects are expected from EPU or Unit 1 recovery (no copper alloy tubes).
16. Entrainment of phytoplankton and zooplankton.	1 SMALL. Entrainment of phytoplankton and zooplankton has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term.	Addressed in SEIS § 3.10.5. Plankton communities have shown no consistent changes in species composition or densities in either near or far field of BFN.	Addressed in SEIS § 3.10.5. No adverse effects are expected from EPU or Unit 1 recovery.
17. Cold Shock.	1 SMALL. Cold shock has been satisfactorily mitigated at operating nuclear plants with once-through cooling systems, has not endangered fish populations or been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds, and is not expected to be a problem during the license renewal term.	TVA studies have documented that thermal releases from BFN have not had a significant impact on the aquatic communities of Wheeler Reservoir. Nuclear plants do not shut down rapidly and have decay heat as a buffer; therefore, cold shock is highly unlikely. Furthermore, with the BFN diffuser configuration, aquatic organisms are tempered with ambient water temperatures and do not experience a rapid temperature change.	Neither Unit 1 recovery nor EPU will adversely affect the aquatic communities in the vicinity of BFN.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
18. Thermal plume barrier to migrating fish.	1 SMALL. Thermal plumes have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.	Addressed in SEIS § 3.10.5. TVA studies have documented that thermal releases from BFN have not had a significant impact on the aquatic communities of Wheeler Reservoir and are not expected to adversely affect the aquatic communities of Wheeler Reservoir in the future.	Addressed in SEIS § 3.10.5. TVA studies of thermal releases from BFN have demonstrated that there is no significant impact on the aquatic communities of Wheeler Reservoir due to Unit 1 recovery and EPU.
19. Distribution of aquatic organisms.	1 SMALL. Thermal discharge may have localized effects but is not expected to affect the larger geographical distribution of aquatic organisms.	Addressed in SEIS § 3.10.5. TVA studies have documented that thermal releases from BFN have not had a significant impact on the aquatic community of Wheeler Reservoir.	Addressed in SEIS § 3.10.5. Neither EPU nor recovery of Unit 1 is expected to alter the distribution of aquatic organisms in Wheeler Reservoir.
20. Premature emergence of aquatic insects.	1 SMALL. Premature emergence has been found to be a localized effect at some operating nuclear plants but has not been a problem and is not expected to be a problem during the license renewal term.	Addressed in SEIS § 3.10.2. Benthic macroinvertebrate communities rated from good to excellent in the vicinity of BFN during annual Vital Signs monitoring. Premature emergence has not been recorded during multiple field studies.	Addressed in SEIS § 3.10.2. Premature emergence is not expected to occur from EPU or recovery of Unit 1.
21. Gas super-saturation (gas bubble disease).	1 SMALL. Gas super-saturation was a concern at a small number of operating nuclear power plants with once-through cooling systems but has been satisfactorily mitigated. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term.	BFN has discharge diffusers to promote rapid mixing in the river and does not have discharge canals with resident fish populations. Gas bubble disease has not been recorded during multiple biological surveys conducted in the vicinity of BFN.	No gas super-saturation effects are expected from EPU or Unit 1 recovery.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
22. Low dissolved oxygen in the discharge.	1 SMALL. Low dissolved oxygen has been a concern at one nuclear power plant with a once-through cooling system but has been effectively mitigated. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term.	Water released from Guntersville Dam, located upstream of BFN, is well oxygenated. These releases are mixed with the effluent of BFN near the diffusers located in the middle of the river channel. The aquatic communities from both fish and benthic macroinvertebrates have not shown effects from low dissolved oxygen.	The aquatic communities from both fish and benthic macroinvertebrates are not expected to be adversely affected from EPU or recovery of Unit 1.
23. Losses from predation, parasitism, and disease among organisms exposed to sub-lethal stresses.	1 SMALL. These types of losses have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.	Reservoir Fisheries Assemblage and benthic macroinvertebrate indices rated good to excellent in BFN's annual biological monitoring program. The indication of predation, parasitism, and disease has not been noted during annual field assessments.	Losses from predation, parasitism, and disease, if any, are not expected to increase from EPU or recovery of Unit 1.
24. Stimulation of nuisance organisms (e.g., shipworms).	1 SMALL. Stimulation of nuisance organisms has been satisfactorily mitigated at the single nuclear power plant with a once-through cooling system where previously it was a problem. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term.	Plankton and benthic samples collected in Wheeler Reservoir have illustrated no differences in the occurrences of nuisance species above or below BFN.	No adverse stimulation of nuisance species is expected from EPU or Unit 1 recovery.

Aquatic Ecology (for plants with once-through and cooling pond heat dissipation systems)

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
25. Entrainment of fish and shellfish in early life stages.	2 SMALL, MODERATE, OR LARGE. The impacts of entrainment are small at many plants but may be moderate or even large at a few plants with once-through and cooling-pond cooling systems. Further, on-going efforts in the vicinity of these plants to restore fish populations may increase the numbers of fish susceptible to intake effects during the license renewal period such that entrainment studies conducted in support of the original license may no longer be valid. See § 51.53(c)(3)(ii)(B).	Addressed in ER § E.4.2 and SEIS § 3.10.4. No significant impacts are expected from entrainment of larval fish. BFN is currently monitoring entrainment effects for comparison to historical entrainment studies and will update the database to assess any effects of future operational changes.	Addressed in ER § E.4.2 and SEIS § 3.10.4. Entrainment of larval fish is not expected to increase from EPU or recovery of Unit 1.
26. Impingement of fish and shellfish.	2 SMALL, MODERATE, OR LARGE. The impacts of impingement are small at many plants but may be moderate or even large at a few plants with once-through and cooling-pond systems. See § 51.53 (c)(3)(ii)(B).	Addressed in ER § E.4.3 and SEIS § 3.10.4. No significant impacts are expected from Impingement of juvenile and adult fish. BFN is currently monitoring impingement effects for comparison to historical impingement studies and will update the database to assess any effects of future operational changes.	Addressed in ER § E.4.3 and SEIS § 3.10.4. Impingement of juvenile and adult fish is not expected to increase from EPU or recovery of Unit 1.
27. Heat shock.	2 SMALL. MODERATE, OR LARGE. Because of continuing concerns about heat shock and the possible need to modify thermal discharges in response to changing environmental conditions, the impacts may be of moderate or large significance at some plants. See § 51.53(c)(3)(ii)(B).	Addressed in ER § E.4.4 and SEIS § 3.10.5. TVA studies have documented that thermal releases from BFN have not had a significant impact on the aquatic community of Wheeler Reservoir.	Addressed in ER § E.4.4 and SEIS § 3.10.5. No adverse heat shock effects are expected under current permit conditions from EPU or Unit 1 recovery.

Aquatic ecology (for plants with cooling-tower-based heat dissipation systems)

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
28. Entrainment of fish and shellfish in early life stages.	1 SMALL. Entrainment of fish has not been found to be a problem at operating nuclear power plants with this type of cooling system and is not expected to be a problem during the license renewal term.	Addressed in ER § E.4.2 and SEIS § 3.10.4. BFN is currently monitoring entrainment effects for comparison to historical entrainment studies and will update the database to assess any effects of future operational changes.	Addressed in ER § E.4.2 and SEIS § 3.10.4. Entrainment of larval fish is not expected to increase from EPU or recovery of Unit 1.
29. Impingement of fish and shellfish.	1 SMALL. The impingement has not been found to be a problem of operating nuclear power plants with this type of cooling system and is not expected to be a problem during the license renewal term.	Addressed in ER § E.4.3 and SEIS § 3.10.4. BFN is currently monitoring impingement effects for comparison to historical impingement studies and will update the database to assess any effects of future operational changes.	Addressed in ER § E.4.3 and SEIS § 3.10.4. Impingement of juvenile and adult fish is not expected to increase from EPU or recovery of Unit 1.
30. Heat shock.	1 SMALL. Heat shock has not been found to be a problem at operating nuclear power plants with this type of cooling system and is not expected to be a problem during the license renewal term.	Addressed in ER § E.4.4 and SEIS § 3.10.5. TVA studies have documented that thermal releases from BFN have not had a significant impact on the aquatic community of Wheeler Reservoir.	Addressed in ER § E.4.4 and SEIS § 3.10.5. No adverse heat shock effects are expected under current permit conditions from EPU or Unit 1 recovery.

Groundwater Use and Quality

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
31. Impacts of refurbishment on groundwater use and quality.	1 SMALL. Extensive dewatering during the original construction on some sites will not be repeated during refurbishment on any sites. Any plant wastes produced during refurbishment will be handled in the same manner as in current operating practices and are not expected to be a problem during the license renewal term.	Not applicable (no refurbishment is needed for license renewal).	Reference ER §§ E.4.5 and E.4.8. Plant discharges from operation are managed to meet NPDES requirements, and BMPs are employed to mitigate any temporary construction impacts associated with Unit 1 recovery or EPU. Any construction dewatering would be temporary and insignificant.
32. Groundwater use conflicts (potable and service water; plants that use <100 gpm).	1 SMALL. Plants using less than 100 gpm are not expected to cause any groundwater-water use conflicts.	Reference ER § E.4.5. There is no groundwater use at BFN now or anticipated during the term of renewed licenses. Any construction de-watering would be temporary and insignificant.	Reference ER § E.4.5. There is no groundwater use at BFN associated with Unit 1 recovery or EPU or any other project.
33. Groundwater use conflicts (potable and service water, and dewatering plants that use >100 gpm).	2 SMALL, MODERATE, OR LARGE. Plants that use more than 100 gpm may cause groundwater use conflicts with nearby groundwater users. See § 51.53(c)(3)(ii)(C).	Reference ER § E.4.5. There is no groundwater use at BFN now or anticipated during the term of renewed licenses. Any construction de-watering would be temporary and insignificant.	Reference ER § E.4.5. There is no groundwater use at BFN associated with Unit 1 recovery or EPU or any other project.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
34. Groundwater use conflicts (plants using cooling towers withdrawing make-up water from a small river).	2 SMALL, MODERATE, OR LARGE. Water use conflicts may result from surface water withdrawals from small water bodies during low flow conditions which may affect aquifer recharge, especially if other groundwater or upstream surface water users come on line before the time of license renewal. See § 51.53 (c)(3)(ii)(A).	Reference ER § E.4.1 and § E.4.6. The amount of water consumed by BFN is insignificant relative to the available flow rate in the reservoir. Also, there is no groundwater use at BFN now or anticipated during the term of renewed licenses.	Reference ER § E.4.1 and § E.4.6. No changes of any significance to the amount of river water consumed by BFN are associated with Unit 1 restart or EPU. Also, there is no groundwater use at BFN associated with Unit 1 recovery or EPU or any other project.
35. Groundwater use conflicts (Ranney wells).	2 SMALL, MODERATE OR LARGE. Ranney wells can result in potential groundwater-water depression beyond the site boundary. Impacts of large groundwater-water withdrawal for cooling tower make-up at nuclear power plants using Ranney wells must be evaluated at the time of application to license renewal. See § 51.53 (c)(3)(ii)(C).	Reference ER § E.4.7. BFN does not use Ranney wells and has no plans to do so.	Reference ER § E.4.7. BFN does not use Ranney wells and has no plans to do so.
36. Groundwater quality degradation (Ranney wells).	1 SMALL. Groundwater quality at river sites may be degraded by induced infiltration of poor-quality river water into an aquifer that supplies large quantities of reactor cooling water. However, the lower quality infiltrating water would not preclude the current uses of groundwater and is not expected to be a problem during the license renewal term.	Reference ER § E.4.7. BFN does not use Ranney wells and has no plans to do so.	Reference ER § E.4.7. BFN does not use Ranney wells and has no plans to do so.
37. Groundwater quality degradation (saltwater intrusion).	1 SMALL. Nuclear power plants do not contribute significantly to saltwater intrusion.	BFN is located on interior nonsaline (fresh) waters, not near coastal saltwater sources.	BFN is located on interior nonsaline (fresh) waters, not near coastal saltwater sources.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
38. Groundwater quality degradation (cooling ponds in salt marshes).	1 SMALL. Sites with closed-cycle cooling ponds may degrade groundwater-water quality. Because water in salt marshes is brackish, this is not a concern for plants located in salt marshes.	BFN does not utilize closed-cycle cooling ponds and is not adjacent to saltwater sources such as salt marshes.	BFN does not utilize closed-cycle cooling ponds and is not adjacent to saltwater sources such as salt marshes.
39. Groundwater quality degradation (cooling ponds at inland sites).	2 SMALL, MODERATE, OR LARGE. Sites with closed-cycle cooling ponds may degrade groundwater-water quality. For plants located inland, the quality of the groundwater water in the vicinity of the ponds must be shown to be adequate to allow continuation of current uses. See § 51.53 (c)(3)(ii)(D).	Reference ER § E.4.8. BFN does not utilize cooling ponds.	Reference ER § E.4.8. BFN does not utilize cooling ponds.

Terrestrial Resources

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
40. Refurbishment impacts.	2 SMALL, MODERATE, OR LARGE. Refurbishment impacts are insignificant if no loss of important plant and animal habitat occurs. However, it cannot be known whether important plant and animal communities may be affected until the specific proposal is presented with the license renewal application. See § 51.53 (c)(3)(ii)(E).	Not applicable (no refurbishment is needed for license renewal).	Reference ER § E.4.9. No plant or animal habitats of any significance will be impacted by the activities or minor structural changes associated with the several proposed changes at BFN.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
41. Cooling tower impacts on crops and ornamental vegetation.	1 SMALL. Impacts from salt drift, icing, fogging, or increased humidity associated with cooling tower operation have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.	BFN typically runs its cooling towers for only a few weeks in the peak summer heating period. Due in part to the short operating period at this time of year, no noticeable impacts from salt drift, icing, fogging, or increased humidity are anticipated.	The amount of time BFN typically runs its cooling towers is not expected to change significantly with EPU and Unit 1 recovery.
42. Cooling tower impacts on native plants.	1 SMALL. Impacts from salt drift, icing, fogging, or increased humidity associated with cooling tower operation have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.	BFN typically runs its cooling towers for only a few weeks in the peak summer heating period. Due in part to the short operating period at this time of year, no noticeable impacts from salt drift, icing, fogging, or increased humidity are anticipated.	The amount of time BFN typically runs its cooling towers is not expected to change significantly with EPU and Unit 1 recovery.
43. Bird collisions with cooling towers.	1 SMALL. These collisions have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.	BFN has not experienced bird kills due to the cooling towers, probably because they are relatively short (~65 feet above ground) and the adjacent spoils berm is higher (~70 feet).	The 6th tower for Unit 1 restart is approximately the same height as the others and would therefore not be expected to be any different regarding bird kills.
44. Cooling pond impacts on terrestrial resources.	1 SMALL. Impacts of cooling ponds on terrestrial ecological resources are considered to be of small significance at all sites.	Not applicable: BFN does not have cooling ponds.	Not applicable: BFN does not have cooling ponds.
45. Power line right-of-way (cutting and herbicide application).	1 SMALL. The impacts of right-of-way maintenance on wildlife are expected to be of small significance at all sites.	Reference ER Attachment E-6. TVA TOM has a line maintenance process that incorporates environmental protections.	Reference ER Attachment E-6. No changes to the TVA TOM line maintenance process are anticipated for several proposed activities at BFN.
46. Bird collision with power lines.	1 SMALL. Impacts are expected to be of small significance at all sites.	Reference ER Attachment E-6. No problem with bird kills has been observed by transmission line maintenance personnel.	Reference ER Attachment E-6. No new transmission lines (but some upgrades) are needed for Unit 1 restart and EPU.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
47. Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock).	1 SMALL. No significant impacts of EMF on terrestrial flora and fauna have been identified. Such effects are not expected to be a problem during the license renewal term.	Reference SEIS § 3.20.4 and ER Attachment E-6. No significant impacts of EMF on flora or fauna are known from TVA transmission lines. TVA/TPS personnel stay abreast of these issues via participation in an EPRI taskforce on EMF effects.	Reference SEIS § 3.20.4 and ER Attachment E-6. Neither Unit 1 restart, EPU, nor the other proposed activities will increase line voltages. EPU will increase line currents proportionately, but based on experience with varying line loadings no significant impacts of EMF on flora and fauna are anticipated. TVA lines easily meet Florida/New York standards for transmission line magnetic field, even with increased EPU currents.
48. Floodplains and wetlands on power line right-of-way.	1 SMALL. Periodic vegetation control is necessary in forested wetlands underneath power lines and can be achieved with minimal damage to the wetland. No significant impact is expected at any nuclear power plant during the license renewal term.	Reference ER Attachment E-6. TVA standard Best Management Practices are employed to avoid or minimize impacts to the identified potential wetland areas and floodplains. When wetland avoidance is not possible, the appropriate Federal Section 404 Nationwide Permits and State permits are obtained for those maintenance activities that may require permits. TVA has procedures in place to identify potential wetland areas in transmission line ROWs. Wetlands specialists perform office-level reviews of National Wetland Inventory data. TVA-produced low-elevation aerial photographs of transmission line structures and surrounding ROW, county soil surveys, and county hydric soils lists to identify the locations of potential wetland areas. TVA uses previously developed subclass review criteria to ensure that maintenance or construction of transmission lines in floodplains would result in minor impacts.	Reference ER Attachment E-6 and FSEIS § 4.3.14.5. The only change to power lines currently contemplated for EPU or Unit 1 restart is the reconductoring of the Madison to Redstone transmission line (13.2 miles), which will be done in accordance with TVA environmental protection procedures and Best Management Practices. All other transmission line impacts involve equipment additions utilizing available spaces at existing substation and switchyard facilities. Potential floodplain impacts would be minor because the only activities in these areas would be associated with transmission line and ROW maintenance.

Threatened or Endangered Species (all plants)

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
49. Threatened or endangered species.	2 SMALL, MODERATE, OR LARGE. Generally, plant refurbishment and continued operation are not expected to adversely affect threatened or endangered species. However, consultation with appropriate agencies would be needed at the time of license renewal to determine whether threatened or endangered species are present and whether they would be adversely affected. See § 51.53 (c)(3)(ii)(E).	Reference ER § E.4.10. No refurbishment is needed for license renewal. No candidate or listed species are known on or immediately adjacent to BFN lands. Therefore, no effects on rare species are anticipated for license renewal.	Reference ER § E.4.10. No candidate or listed species are known on or immediately adjacent to lands which may be disturbed by actions associated with Unit 1 recovery, EPU, or dry cask storage of spent fuel. TVA Transmission Operations and Maintenance utilizes a line maintenance process that incorporates environmental protections. Therefore, no effects on rare species are anticipated.

Air Quality

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
50. Air quality during refurbishment (nonattainment and maintenance areas).	2 SMALL, MODERATE, OR LARGE. Air quality impacts from plant refurbishment associated with license renewal are expected to be small. However, vehicle exhaust emissions could be cause for concern at locations in or near nonattainment or maintenance areas. The significance of the potential impact cannot be determined without considering the compliance status of each site and the numbers of workers expected to be employed during the outage. See § 51.53 (c)(3)(ii)(F).	Not applicable (no refurbishment is needed for license renewal).	Reference ER § E.4.11. No nonattainment areas are designated at or near BFN. No air impacts of any significance are associated with Unit 1 restart and EPU.
51. Air quality effects of transmission lines.	1 SMALL. Production of ozone and oxides of nitrogen is insignificant and does not contribute measurably to ambient levels of these gasses.	Reference ER Attachment E-6. Since line voltages and line use continue unchanged, no impacts are projected for license renewal.	Reference ER Attachment E-6. Since line voltages and line use are unchanged, no impacts are projected for EPU and/or Unit 1 restart.

Land Use

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
52. On-site land use.	1 SMALL. Projected on-site land use changes required during refurbishment and the renewal period would be a small fraction of any nuclear power plant site and would involve land that is controlled by the applicant.	Reference ER § E.3.2. No land use changes are projected for license renewal or through the renewed license period.	Reference ER § E.3.2. No land use changes result from EPU. Associated with Unit 1 recovery, a new admin building has been constructed, and a new mod/fab building, ISFSI, and 6th cooling tower are being constructed, all on previously disturbed land (no impact).
53. Power line right-of-way.	1 SMALL. Ongoing use of power line right-of-ways would continue with no change in restrictions. The effects of these restrictions are of small significance.	Reference ER §§ E.3.1.7 and E.3.2. No new line right-of-ways or construction of new transmission lines will be required for license renewal.	Reference ER §§ E.3.1.7 and E.3.2. No new line right-of-ways or construction of new transmission lines will be required for Unit 1 restart or EPU.

Human Health

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
54. Radiation exposures to the public during refurbishment.	1 SMALL. During refurbishment, the gaseous effluents would result in doses that are similar to those from current operation. Applicable regulatory dose limits to the public are not expected to be exceeded.	Not applicable (no refurbishment is needed for license renewal).	Reference SEIS §§ 3.21, 4.2.21, 4.3.21. Doses to the public are not expected to increase during Unit 1 recovery and mods for EPU. Any small increase that might occur would still be far below allowable limits.
55. Occupational radiation exposures during refurbishment.	1 SMALL. Occupational doses from refurbishment are expected to be within the range of annual average collective doses experienced for pressurized-water reactors and boiling-water reactors. Occupational mortality risk from all causes including radiation is in the mid-range for industrial settings.	Not applicable (no refurbishment is needed for license renewal).	Reference SEIS §§ 3.21, 4.2.21.1.1, and 4.3.21.1.1. Occupational radiation exposures for Unit 1 recovery and modifications for EPU are forecasted to be comparable to industry BWR annual average collective dose. Risks for occupational radiation exposure mortality are deemed not greater than those for the BWR industry. Regulatory occupational dose limits will continue to be met.
56. Microbiological organisms (occupational health).	1 SMALL. Occupational health impacts are expected to be controlled by continued application of accepted industrial hygiene practices to minimize worker exposures.	Reference SEIS § 3.20.6 and ER § E.4.12. Depending upon conditions, BFN has at times required respiratory protection for workers doing certain cooling tower tasks such as basin cleanout. However, based on past experience, no problems in this area are anticipated.	Reference SEIS § 3.20.6 and ER § E.4.12. No tasks necessary for EPU or Unit 1 recovery are projected to present a threat to workers from microbiological pathogens.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
57. Microbiological organisms (public health), (plants using lakes or canals, or cooling towers or cooling ponds that discharge to a small river).	2 SMALL, MODERATE, OR LARGE. These organisms are not expected to be a problem at most operating plants except possibly at plants using cooling ponds, lakes, or canals that discharge to small rivers. Without site-specific data, it is not possible to predict the effects generically. See § 51.53(c)(3)(ii)(G).	Reference ER § E.4.12. Based on past operational experience with discharged cooling water and cooling tower operation and maintenance, no problems are anticipated through the renewed license period.	Reference ER § E.4.12. No tasks necessary for EPU or Unit 1 recovery are projected to present a threat to the public from microbiological pathogens.
58. Noise.	1 SMALL. Noise has not been found to be a problem at operating plants and is not expected to be a problem at any plant during the license renewal term.	Noise is addressed extensively in the SEIS, §§ 3.19, 4.2.19, and 4.3.19. BFN has operated six cooling towers successfully (and without complaint) in the past and, therefore, is expected to continue doing so through the renewed license period.	Noise is addressed in the SEIS, §§ 3.19, 4.2.19, and 4.3.19. The only potentially noticeable noise impact of Unit 1 restart is associated with the sixth cooling tower, located at the NW edge of the site adjacent to a subdivision, to be rebuilt and operated a few weeks during hot weather. EPU and Unit 1 could cause the towers to operate more often but will have no significant noise impacts.
59. Electromagnetic fields, acute effects (electric shock).	2 SMALL. MODERATE, OR LARGE. Electrical shock resulting from direct access to energized conductors or from induced charges in metallic structures have not been found to be a problem at most operating plants and generally are not expected to be a problem during the license renewal term. However, site-specific review is required to determine the significance of the electric shock potential of the site. See § 51.53(c)(3)(ii)(H).	Reference ER § E.4.13 and Attachment E-3. The electric shock potential from induced current of 500-kV and 161-kV transmission lines in the vicinity of BFNP was determined in accordance with procedures specified by EPRI and found to be within safe limits as defined by the National Electrical Safety Code. No changes are being made for license renewal that would alter this conclusion.	Reference ER § E.4.13 and Attachment E-3. Neither the restart of Unit 1 nor the EPU will change any of the parameters by which the electric shock potential of the area transmission lines was evaluated (and found to be acceptable).

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
60. Electromagnetic fields, chronic effects.	N/A UNCERTAIN. Biological and physical studies of 60-Hz electromagnetic fields have not found consistent evidence linking harmful effects with field exposures. However, research is continuing in this area and a consensus scientific view has not been reached.	Reference SEIS § 3.20. No significant impacts of EMF on human health are known from TVA transmission lines. TVA lines will continue to easily meet Florida/New York standards for transmission line magnetic field strength. TVA/TPS personnel stay abreast of this issue via participation in the EPRI taskforce on EMF effects.	Reference SEIS § 3.20. Neither Unit 1 restart nor EPU will increase line voltages. EPU will increase line currents proportionately, but based on experience with varying line loadings no significant impacts of EMF on human health are anticipated. Even with increased EPU currents, TVA lines meet Florida/New York standards for transmission line magnetic field strength.
61. Radiation exposures to the public (license renewal term).	1 SMALL. Radiation doses to the public will continue at current levels associated with normal operations.	Reference SEIS §§ 3.21, 4.2.21, and 4.3.21. Doses to the public during the renewed license period are projected to remain far below allowable limits, with no impact to the public.	Reference SEIS §§ 3.21, 4.2.21, and 4.3.21. Doses to the public may increase slightly with Unit 1 restart and EPU, but would remain far below allowable limits.
62. Occupational radiation exposures (license renewal term).	1 SMALL. Projected maximum occupational doses during the license renewal term are within the range of doses experienced during normal operations and normal maintenance outages and would be well below regulatory limits.	Reference SEIS §§ 3.21, 4.2.21, and 4.3.21. Regulatory dose limits will continue to be met and no changes to occupational dose rates are expected during the renewed license term.	Reference SEIS §§ 3.21, 4.2.21.1.1, and 4.3.21.1.1. Unit 1 operation will increase total occupational dose proportionate to a three-unit dose complement, and EPU is expected to increase dose slightly less than a direct proportionality with the increased power level. Regulatory dose limits will continue to be met. No further changes to occupational dose rates are expected.

Socioeconomics [and Cultural Resources]

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
63. Housing impacts.	2 SMALL, MODERATE, OR LARGE. Housing impacts are expected to be of small significance at plants located in a medium or high population area and not in an area where growth control measures that limit housing development are in effect. Moderate or large housing impacts of the workforce associated with refurbishment may be associated with plants located in sparsely populated areas or in areas with growth control measures that will limit housing development. See § 51.53(c)(3)(ii)(I).	Reference ER § E.2.6 and § E.4.14. Since operational employment through the renewed license period is projected to remain at only 150 workers above that of current operations, no significant impacts are anticipated.	Reference ER § E.2.6 and § E.4.14. The influx of temporary workers for Unit 1 recovery has not had a significant impact on housing in the area, and the cumulative impacts associated with EPU and other projects will be minor.
64. Public services: public safety, social services, and tourism and recreation.	1 SMALL. Impacts to public safety, social services, tourism, and recreation are expected to be of small significance at all sites.	Reference ER § E.2.6 and § E.3.4, and SEIS § 4.3.13. Since operational employment through the renewed license period is projected to remain at only 150 workers above that of current operations, no significant impacts are anticipated.	Reference ER § E.2.6 and § E.3.4, and SEIS § 4.3.13. Some possible short-term impacts on community services such as schools were anticipated as a result of the temporary worker influx for Unit 1 recovery but nothing noticeable has materialized.
65. Public services: public utilities.	2 SMALL OR MODERATE. An increased problem with water shortages at some sites may lead to impacts of moderate significance on public water supply availability. See § 51.53 (c)(3)(ii)(I).	Reference ER § E.4.15. Since operational employment through the renewed license period is projected to remain at only 150 workers above that of current operations, no significant impacts are anticipated.	Reference ER § E.4.15. No problems have been experienced by local potable water supply utilities in meeting increased demands associated with the temporary worker influx associated with Unit 1 recovery and other projects.
66. Public services, education (refurbishment).	2 SMALL, MODERATE, OR LARGE. Most sites would experience impacts of small significance, but larger impacts are possible depending on site- and project-specific factors. See § 51.53 (c)(3)(ii)(I).	Not applicable (no refurbishment is needed for license renewal).	Reference ER § E.4.16. The temporary worker influx for Unit 1 recovery and other projects has not resulted in any noticeable impacts on local schools.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
67. Public services, education (license renewal term).	1 SMALL. Only impacts of small significance are expected.	Reference ER § E.3.4 and § E.4.14.2, and SEIS § 4.3.13. Since operational employment through the renewed license period is projected to remain at only 150 workers above that of current operations, no significant impacts are anticipated.	Reference ER § E.3.4 and § E.4.14.2, and SEIS § 4.3.13. The increase in permanent staffing for Unit 1 operation is only 150, and no increase is needed for EPU and other projects; therefore, impacts are negligible.
68. Off-site land use (refurbishment).	2 SMALL OR MODERATE. Impacts may be of moderate significance at plants in low population areas. See § 51.53 (c)(3)(ii)(I).	Not applicable (no refurbishment is needed for license renewal).	Reference ER § E.4.17.1. The increased worker population for Unit 1 recovery and other projects is temporary and small compared to the existing population; therefore, impacts are negligible.
69. Off-site land use (license renewal term).	2 SMALL, MODERATE, OR LARGE. Significant changes in land use may be associated with population and tax revenue changes resulting from license renewal. See § 51.53 (c)(3)(ii)(I).	Reference ER § E.4.17.2. Since operational employment through the renewed license period is projected to remain at only 150 workers above that of current operations and little, if any, growth in the area is attributable to BFN, no significant impacts are anticipated.	Reference ER § E.4.17.2. The increase in permanent staffing for Unit 1 operation is only 150. No increase is needed for EPU and other projects, and little, if any, growth in the area is attributable to BFN; therefore, impacts are negligible.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
70. Public services, transportation.	2 SMALL, MODERATE, OR LARGE. Transportation impacts (level of service) of highway traffic generated during plant refurbishment and during the term of the renewed license are generally expected to be of small significance. However, the increase in traffic associated with additional workers and the local road and traffic control conditions may lead to impacts of moderate or large significance at some sites. See § 51.53 (c)(3)(ii)(J).	Reference ER § E.4.18. Since operational employment through the renewed license period is projected to remain at only 150 workers above that of current operations, no significant impacts are anticipated.	Reference ER § E.4.18. Large temporary influx of workers for Unit 1 recovery and other projects results in moderate impact on local traffic.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
71. Historic and archaeological resources.	2 SMALL, MODERATE, OR LARGE. Generally, plant refurbishment and continued operation are expected to have no more than small adverse impacts on historic and archaeological resources. However, the National Historic Preservation Act requires the federal agency to consult with the State Historic Preservation Officer to determine whether there are properties present that require protection. See § 51.53 (c)(3)(ii)(K).	Reference ER § E.4.19. While future activities related to BFN license renewal are expected to have an insignificant effect on historic properties, each activity will be reviewed by TVA Cultural Resources on a case-by-case basis. These activities will include new construction or maintenance activities that will result in ground disturbance. Affects to historic properties as a result of any future ground disturbance will be reviewed in consultation with the Alabama SHPO and all affiliated Indian tribes. However, no refurbishment is necessary for license renewal, and there is a small likelihood of any such ground disturbances.	Reference ER § E.4.19. No impacts to cultural sites are expected for EPU or Unit 1 restart or other contemplated BFN activities.
72. Aesthetic impacts (refurbishment)	1 SMALL. No significant impacts are expected during refurbishment.	Not applicable (no refurbishment is needed for license renewal).	Reference SEIS §§ 3.16, 4.2.16, and 4.3.16. No significant changes to site appearance are planned for Unit 1 recovery or other projects (6th cooling tower previously existed; the new admin and mods/fab buildings are dominated by existing structures).
73. Aesthetic impacts (license renewal term).	1 SMALL. No significant impacts are expected during the license renewal term.	Reference SEIS §§ 3.16, 4.2.16, and 4.3.16. After license renewal, no further new buildings are planned.	Reference SEIS §§ 3.16, 4.2.16, and 4.3.16. No exterior changes to site structures are needed for EPU. The only new buildings contemplated are for Unit 1 recovery and restart.
74. Aesthetic impacts of transmission lines (license renewal term).	1 SMALL. No significant impacts are expected during the license renewal term.	Reference SEIS §§ 3.14, 3.16, 4.2.14, 4.2.16, 4.3.14, and 4.3.16. No changes to the transmission lines are contemplated for license renewal.	Reference SEIS §§ 3.14, 3.16, 4.2.14, 4.2.16, 4.3.14, and 4.3.16. Other than reconductoring one line, no changes to the transmission lines are contemplated for Unit 1 restart or any other projects.

Postulated Accidents

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
75. Design Basis Accidents.	1 SMALL. The NRC staff has concluded that the environmental impacts of design basis accidents are of small significance for all plants.	No changes to DBAs are contemplated for license renewal.	The only potential changes to DBAs would be addressed in the EPU submittals; no potential impacts are associated with LR or Unit 1 restart.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
76. Severe Accidents.	2 SMALL. The probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater water, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. See § 51.53(c)(3)(ii)(L).	Addressed in ER Attachment E-4. No changes to the SAMA are required for the period of renewed operating licenses.	Addressed in ER Attachment E-4. Updated SAMA analyses reflect Unit 1 recovery, EPU, BLEU, and change in fuel vendor.

Uranium Fuel Cycle and Waste Management

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
77. Off-site radiological impacts (individual effects from other than the disposal of spent fuel and high level waste).	1 SMALL. Off-site impacts of the uranium fuel cycle have been considered by the Commission in Table S-3 of this part. Based on information in the GEIS, impacts on individuals from radioactive gaseous and liquid releases including radon-222 and technetium-99 are small.	Addressed in SEIS §§ 3.21, 4.2.21, and 4.3.21. Individually, off-site radiological dose impacts will remain well within regulatory limits and produce no noticeable impacts during the renewed license operating period.	Addressed in SEIS §§ 3.21, 4.2.21, and 4.3.21. Unit 1 restart and operation at EPU will both result in a small increase in off-site radiological dose, but these will remain well within regulatory limits and produce no noticeable impacts. The volume of low-level radwaste will increase proportionately, but its characterization will be unchanged. Operation with BLEU is indistinguishable from current feedstock in these regards.
78. Off-site radiological impacts (collective effects).	Category 1 (Findings too long to repeat here).	Addressed in SEIS §§ 3.21, 4.2.21, and 4.3.21. Collectively, off-site radiological dose impacts will remain well within regulatory limits and produce no noticeable impacts during the renewed license operating period.	Addressed in SEIS §§ 3.21, 4.2.21, and 4.3.21. Unit 1 restart and operation at EPU will both increase collective radiological impacts, but these will remain well within regulatory limits and produce no noticeable impacts. BLEU has no effect.
79. Off-site radiological impacts (spent fuel and high level waste disposal).	Category 1 (Findings too long to repeat here).	Addressed in SEIS §§ 2.2, 2.3, 3.5, 4.2.5, and 4.3.5. Additional spent fuel from the renewed license period would be stored on-site in the spent fuel pool or a dry cask storage system until transferred to DOE at the site boundary in accordance with applicable federal law.	For BLEU, TVA adopted the DOE EIS. Operation with BLEU is no different than with current feed stocks in this or any other regard. Unit 1 restart and EPU will proportionately increase spent fuel and high-level waste, but its characterization is no different than that of existing waste materials.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
80. Nonradiological impacts of the uranium fuel cycle.	1 SMALL. The nonradiological impacts of the uranium fuel cycle resulting from the renewal of an operating license for any plant are found to be small.	Nonradiological impacts of the uranium fuel cycle have been found to be small and are unchanged as the result of continuing operation through the renewed operating license period.	For BLEU, TVA adopted the DOE EIS, which included nonradiological impacts of the uranium fuel cycle. Those nonradiological fuel cycle impacts under TVA control or influence are not expected to change significantly for EPU and Unit 1 restart because the throughput change is small compared to present consumption and is within cycle-to-cycle variations for other reasons.
81. Low-level waste storage and disposal.	1 SMALL. The comprehensive regulatory controls that are in place and the low public doses being achieved at reactors ensure that the radiological impacts to the environment will remain small during the term of a renewed license. The maximum additional on-site land that may be required for low-level waste storage during the term of a renewed license and associated impacts will be small. Nonradiological impacts on air and water will be negligible. The radiological and nonradiological environmental impacts of long-term disposal of low-level waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is a reasonable assurance that sufficient low-level waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.	Reference SEIS §§ 3.3, 4.2.3, and 4.3.3. The environmental impacts associated with low-level waste storage and disposal are minimal.	Reference SEIS §§ 3.3, 4.2.3, and 4.3.3. Unit 1 recovery and EPU will increase proportionately the generation of low-level radwaste, but its characterization and disposition will remain unchanged, including possible temporary on-site storage.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
82. Mixed waste storage and disposal.	1 SMALL. The comprehensive regulatory controls and the facilities and procedures that are in place ensure proper handling and storage, as well as negligible doses and exposure to toxic materials for the public and the environment at all plants. License renewal will not increase the small, continuing risk to human health and the environment posed by mixed waste at all plants. The radiological and nonradiological environmental impacts of long-term disposal of mixed waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is reasonable assurance that sufficient mixed waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.	Reference SEIS §§ 3.4, 4.2.4, and 4.3.4. The state of Alabama has exempted mixed waste from RCRA. BFN typically has very little mixed waste (~3500 lbs/yr), but when it does generate mixed waste it typically will ship it to the Hazardous Waste Storage Facility in Muscle Shoals which holds a permit to receive and disposition mixed waste.	Reference SEIS §§ 3.4, 4.2.4, and 4.3.4. The existing TVA processes for management of mixed waste are adequate for expected volume increases (25-30%) associated with EPU and Unit 1 restart.
83. On-site spent fuel.	1 SMALL. The expected increase in the volume of spent fuel from an additional 20 years of operation can be safely accommodated on-site with small environmental effects through dry or pool storage at all plants, if a permanent repository or monitored retrievable storage is not available.	Reference SEIS §§ 2.2.4, 2.3.2, 3.5, 4.2.5, and 4.3.5. BFN is constructing an ISFSI on-site, which can be used to store spent fuel on-site through the renewed license period or until DOE takes possession.	Reference §§ 2.2.4, 2.3.2, 3.5, 4.2.5, and 4.3.5. The SEIS addressed constructing and operating an ISFSI at BFN. The BFN ISFSI is designed to safely accommodate, with minimal impacts, the (roughly proportional) increased fuel throughput associated with Unit 1 restart and EPU on all three units.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
84. Nonradiological waste.	1 SMALL. No changes to generating systems are anticipated for license renewal. Facilities and procedures are in place to ensure continued proper handling and disposal at all plants.	Reference SEIS §§ 3.3, 4.2.3, 4.2.6, and 4.3.3, 4.3.6. The rate of generation of nonradiological waste will be slightly higher during the renewed license period due to the small increase in permanent plant staff, but existing disposal contractors can accept it.	Reference SEIS §§ 3.3, 4.2.3, 4.2.6, 4.3.3, and 4.3.6. Unit 1 recovery will increase the rate of generation of nonradiological waste but existing disposal contractors can accept it.
85. Transportation (including spent fuel).	1 SMALL. The impacts of transporting spent fuel enriched up to 5 percent uranium-235 with average burnup for the peak rod to current levels approved by NRC up to 62,000 MWd/MTU and the cumulative impacts of transporting high-level waste to a single repository, such as Yucca Mountain, Nevada, are found to be consistent with the impact value contained in 10 CFR 51.52(c), Summary Table S-4 – Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor. If fuel enrichment or burnup conditions are not met, the applicant must submit an assessment of the implications for the environmental impact values reported in § 51.52.	Reference ER § E.4.21. TVA complies fully with enrichment and burnup limits and expects to do so throughout the renewed license period. No increase in the generation of high-level waste is expected during the renewed license period.	Reference ER § E.4.21. No changes to enrichment or burnup limits are anticipated to be necessary for EPU or Unit 1 restart. The throughput of new and spent fuel and high- and low-level radwaste is increased proportionately with Unit 1 restart and EPU, but its characterization is unchanged. Some temporary increase in low-level radwaste is associated with Unit 1 recovery.

Decommissioning

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
86. Radiation doses.	1 SMALL. Doses to the public will be well below applicable regulatory standards regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem caused by build-up of long-lived radionuclides during the license renewal term.	Due largely to improvements in chemistry controls, radiation doses during decommissioning are not projected to be significantly different after 60 years of operation than after 40 years of operation. If planning for decommissioning begins a few years prior to cessation of operations, the final cycle can utilize chemistry controls which result in greatly reduced activation products and much less worker dose.	Reference SEIS § 2.2.5. EPU and Unit 1 restart would both increase radiation doses very slightly to the public and to plant workers during eventual decommissioning. For example, both would mean larger associated spent fuel and radwaste shipments to permanent repositories at the end of plant life.
87. Waste management.	1 SMALL. Decommissioning at the end of a 20-year license renewal period would generate no more solid wastes than at the end of the current license term. No increase in the quantities of Class C or greater than Class C wastes would be expected.	Due largely to improvements in chemistry controls, radwaste during decommissioning is not projected to be significantly different after 60 years of operation than after 40 years of operation. If planning for decommissioning begins a few years prior to cessation of operations, the final cycle can utilize chemistry controls which result in greatly reduced activation products and much less radwaste requiring disposal.	Reference SEIS § 2.2.5. Unit 1 restart and EPU might have very slight increases in wastes to be removed at the time of decommissioning, but no noticeable impacts.
88. Air Quality.	1 SMALL. Air quality impacts of decommissioning are expected to be negligible either at the end of the current operating term or at the end of the license renewal term.	License renewal delays decommissioning which may allow time for technology improvements, but it otherwise has no impact on air quality.	Reference SEIS § 2.2.5. TVA utilizes BMPs to control air quality impacts during any project such as decommissioning. EPU and Unit 1 restart would have no effect.
89. Water Quality.	1 SMALL. The potential for significant water quality impacts from erosion or spills is no greater whether decommissioning occurs after a 20-year license renewal period or after the original 40-year operation period, and measures are readily available to avoid such impacts.	License renewal allows additional decay time for old spills and contamination which can reduce the need for soil washing and other clean-up uses of water; otherwise, it has no impact on water quality.	Reference SEIS § 2.2.5. TVA utilizes BMPs to control erosion and would continue to do so during decommissioning. RWI-007 controls records of spills at BFN. WARL monitors on-site test wells (nothing found except H3 in R3 shallow well, barely detectable). EPU and Unit 1 restart will have no effect.

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
90. Ecological resources.	1 SMALL. Decommissioning after either the initial operating period or after the 20-year license renewal period is not expected to have any direct ecological impacts.	Delaying decommissioning due to license renewal is not known to have any effects on ecological resources.	Reference SEIS § 2.2.5. EPU and Unit 1 restart are not projected to have any noticeable impacts on ecological resources at decommissioning.
91. Socioeconomic impacts.	1 SMALL. Decommissioning would have some short-term socioeconomic impacts. The impacts would not be increased by delaying decommissioning until the end of a 20-year relicense period, but might be decreased by population and economic growth.	The most pragmatic approach to minimize the overall cost of decommissioning may be to limit on-site staff and worker exposures with concomitant schedule adjustments. This reduction in employment would likely be a small impact without license renewal and even less of an impact with renewal due to population and economic growth.	Reference SEIS § 2.2.5. EPU and Unit 1 restart would have no noticeable socioeconomic impact on eventual decommissioning (Unit 1 did operate previously, so is already similar to Units 2 and 3 in its decommissioning needs: EPU results in some increases in spent fuel to be removed, other impacts very small).

Environmental Justice

ISSUE	TABLE B-1 FINDINGS	LICENSE RENEWAL IMPACTS	COMBINED IMPACTS OF ALL ACTIVITIES
92. Environmental justice.	Not applicable/None. The need for and the content of an analysis of environmental justice will be addressed in plant-specific reviews.	Addressed in ER §§ E.2.6, and E.4.22. The disadvantaged population percentage is relatively small in the primary labor market area, but continuing operations via license renewal would avoid negative job impacts of ceasing operations.	Addressed in ER §§ E.2.6, and E.4.22. The cumulative impacts of Unit 1 recovery, EPU, and other projects have a positive impact on the job market for disadvantaged persons without environmental degradation.