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April 26, 2005
Contract No. NRC–02–04–014
Account No. 20.10890.02.002

U.S. Nuclear Regulatory Commission
ATTN.: Mr. Ron C. Linton
Division of Waste Management and
Environmental Protection
Two White Flint North
Mail Stop T7–J08
Washington, DC 20555

Subject: Letter Report—Preliminary Final BWX Technologies, Inc. (BWXT) Environmental Assessment (Milestone 10890.02.002.115)

Dear Mr. Linton:

The purpose of this letter is to transmit the subject deliverable described under Subtask C1 of Task Order 2—Technical Assistance for the Development of an Environmental Assessment for the BWXT License Renewal. The environmental assessment has been revised to incorporate U.S. Nuclear Regulatory Commission (NRC) comments and to include information provided by the licensee in response to NRC requests for additional information. To assist you in your review, we have included an electronic file with redline/strikeout markings to show the changes in the text.

The section on environmental impacts (Section 4.0) was prepared prior to NRC completion of the detailed technical reviews supporting the development of the safety evaluation report. The final draft of this section may need to be updated to reflect any reviews and conclusions in the safety evaluation report applicable to potential environmental impacts.

The section on agencies and persons consulted (Section 5.0) was prepared prior to NRC completion of all consultations. The final draft of this section may need to be updated to reflect any comments or opinions provided by other agencies concerning potential environmental impacts of the proposed action and any applicable NRC responses.

NRC also may want to consider two issues related to preservation of historical resources. The first issue concerns obtaining the specific locations of six archaeological sites on BWXT property. In the Virginia Department of Historic Resources letter dated March 9, 2005, an offer was made to provide NRC with this information. Obtaining the specific location of these archaeological sites now may help expedite future NRC reviews of any potential BWXT license

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amendment requests. The second issue is related to protection of historic resources from BWXT activities that fall short of requiring an NRC license amendment. As indicated in the section on agencies and persons consulted (Section 5.0), NRC will conduct separate environmental reviews for future license amendments requests associated with proposed changes to facility operations or structures as part of the licensing review process. For potential impacts to historic resources from those BWXT activities which may not require a license amendment request, NRC may want to consider the generation of a memorandum of understanding between BWXT and State Historic Preservation Officer or have BWXT develop an internal procedure that addresses the protection of known and undiscovered archaeological resources.

If you have any questions about this deliverable, please contact me at 210.522.2139 or Mr. Bradley Werling by email (bwerling@swri.org) or at 210.522.6565.

Sincerely,

David R. Turner
Assistant Director
Non-Repository Programs

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U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

DIVISION OF WASTE MANAGEMENT AND ENVIRONMENTAL PROTECTION

ENVIRONMENTAL ASSESSMENT RELATED TO THE RENEWAL OF NRC LICENSE NO. SNM–42 FOR BWX TECHNOLOGIES, INC. (BWXT)

DOCKET NO. 70-27

April 2005

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ACRONYMS/ABBREVIATIONS

ALARA	as low as is reasonably achievable
BWXT	BWX Technologies, Inc.
DHR	Department of Historic Resources
EPA	U.S. Environmental Protection Agency
HEPA	high-efficiency particulate air
LTC	Lynchburg Technology Center
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NPD	Nuclear Products Division
NRC	U.S. Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
RCRA	Resource Conservation and Recovery Act
VOC	volatile organic compound
WTF	Waste Treatment Facility

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ENVIRONMENTAL ASSESSMENT
RELATED TO THE RENEWAL OF NRC LICENSE NO. SNM–42
FOR BWX TECHNOLOGIES, INC. (BWXT)

1.0 INTRODUCTION

1.1 Background

By letter dated June 30, 2004, BWX Technologies, Inc., (BWXT) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew materials license SNM–42 for the BWXT Nuclear Products Division (NPD) uranium fuel fabrication and research facility located in Lynchburg, Virginia (BWXT, 2004a). BWXT has conducted operations at the site since 1955. In 1994, NRC approved the consolidation of License SNM–778, which regulated the operations of the Lynchburg Technology Center (LTC), into License SNM–42, which regulated the operations of the (b)(4) License SNM–778 was terminated. The expanded license SNM–42 was renewed in September of 1995 for a 10-year period. The current BWXT request is for a 20-year renewal of license SNM–42. Under SNM–42, BWXT is authorized to receive and possess nuclear materials for the fabrication and assembly of nuclear fuel components under the provisions of 10 CFR Part 70, Domestic Licensing of Special Nuclear Material. Ex 4

This environmental assessment is being prepared in accordance with NRC regulation 10 CFR Part 51, Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions; applicable NRC guidance from NUREG–1748, Environmental Review Guidance for Licensing Actions Associated with Nuclear Material Safety and Safeguards Programs (NRC, 2003a); and the National Environmental Policy Act (NEPA)-implementing regulations, including Council on Environmental Quality regulations (40 CFR Parts 1500–1508). NRC also is conducting a detailed safety review of the BWXT request for license renewal. The results of the detailed safety review will be documented in a separate safety evaluation report.

Documents evaluated in preparing this environmental assessment include the Environmental Report for Renewal of License SNM–42, BWXT; NPD (BWXT, 2004b); the BWXT Response to RAI Questions (Morrell, 2005); and the Supplemental Environmental Assessment for Renewal of Special Nuclear Materials License SNM–42, U.S. Nuclear Regulatory Commission, June 1995 (NRC, 1995a). Additional references are listed in Section 8.0 of this environmental assessment.

1.2 Need for the Proposed Action

BWXT NPD operates an NRC-licensed uranium fuel fabrication and research facility. NPD provides (b)(4) Ex 4
NPD also provides reactor fuel elements and components to research and university facilities, conducts research to examine and improve existing products and processes, and develops new products and processes (b)(4) Ex 4
(b)(4) If the license renewal for the BWXT Lynchburg facility is denied, these activities will likely be performed at another location.

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1.3 The Proposed Action

1.3.1 Description of the Proposed Action

The proposed action is the renewal of special nuclear materials License SNM–42, which would allow the BWXT NPD radiological operations to continue for a period of 20 years beyond the current expiration date of September 2005. BWXT, formerly Babcock and Wilcox, is an operating company of McDermott Inc., which is a subsidiary of McDermott International. There are no plans for any major modifications to the facilities.

(b)(4) Ex 4

Many other activities are performed at the facility, including adjusting enrichment, fabricating targets for irradiation in reactors, examining irradiated and radioactive reactor components, and recovering uranium from scrap material. NPD also prepares and decontaminates hardware for inspecting, evaluating, and measuring reactor components. Radiation source analysis, preparation, and modification are performed in the NPD laboratory facilities.

1.3.2 Description of Facility Activities

The NPD site is in central Virginia along the James River in the northeastern part of Campbell County approximately 8 km [5 mi] east of the city of Lynchburg (Figure 1). The main NPD manufacturing and support facilities are located toward the center of the BWXT site (Figure 2).

(b)(4) Ex 4

Other NPD operations are conducted in the LTC facilities, which are west of the main NPD manufacturing and support facilities. LTC operations are diverse, and a majority of LTC facilities are used for office space and nonradiological operations. Radiological operations are mostly limited to analytical laboratories and an area containing hot cells. A hot cell is a protected area where highly radioactive materials (b)(4) Ex 4 (b)(4) can be tested and examined in a safe environment. Occasionally, high-level radioactive waste is generated in the LTC during cleanup of the hot cell after the completion of projects involving various destructive tests and post irradiation examinations (b)(4) Ex 4 (b)(4) Other facilities associated with the hot cell area include a cask handling area, a transfer canal, and a storage pool. A cask is a container designed to safely store nuclear fuel or other highly radioactive material. Radioactive materials are shipped and received at the cask handling area. The transfer canal and storage pool are used to receive, unload, load, and prepare casks for shipment. The transfer canal and storage pool are also used to transfer radioactive material to and from the hot cells.

The Waste Treatment Facility (WTF) is located to the north of the main NPD manufacturing and support facilities. Liquid waste treatment and decontamination operations are conducted in the WTF. The WTF contains a variety facilities, including equalization tanks, neutralization tanks, other treatment tanks, a microfiltration unit, a sludge processing system, and an equalization

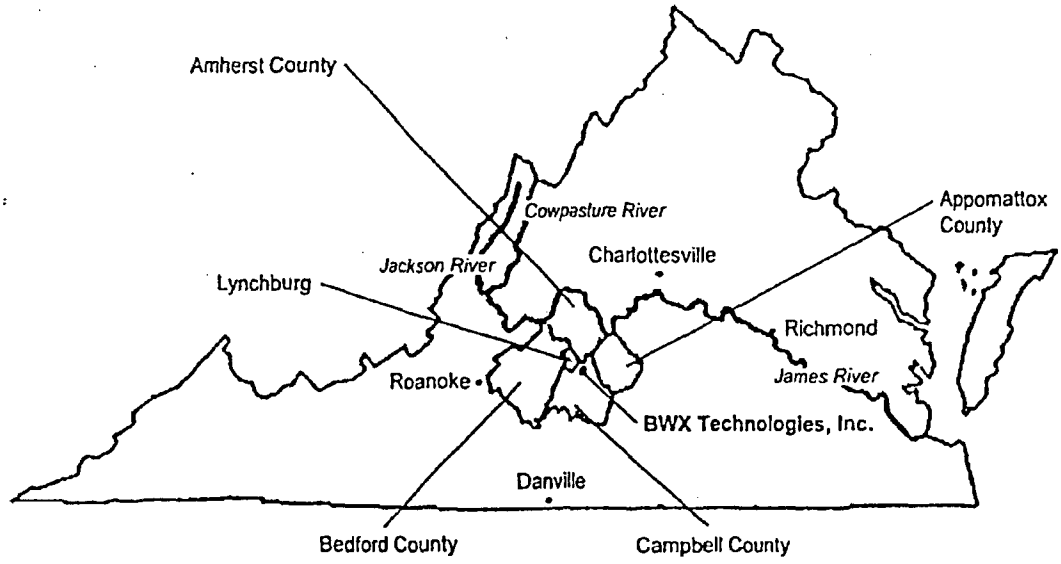

Figure 1. Geographical Location of the Babcock & Wilcox Facility [Modified from NRC (1991)]

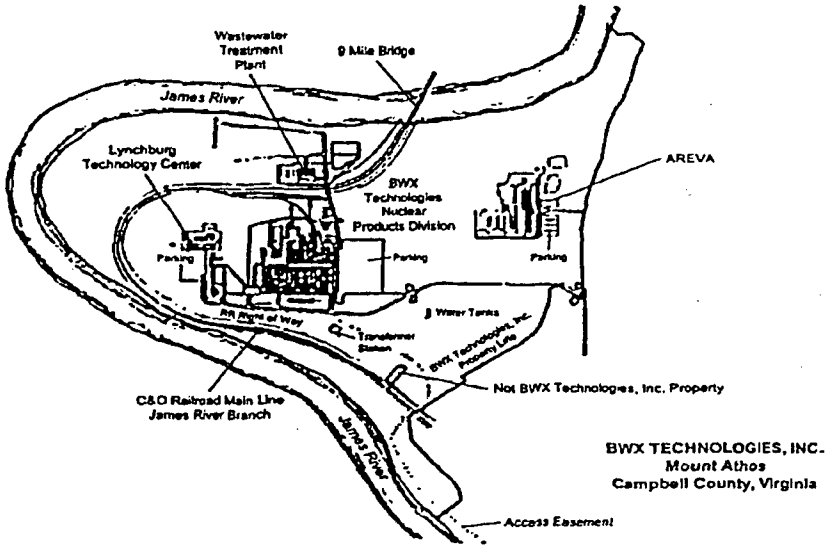

Figure 2. Babcock & Wilcox Facility Map [Modified from NRC (1991)]

pond. The WTF may be used to treat waste water and a variety of other liquids, sludges, and solids. The treatment of low-level radioactive waste water consists of many steps and generates both solid material and liquid effluent. The treatment process solids are packaged in drums that may be compacted and repackaged. These solid wastes are shipped to NRC-approved and licensed low-level radioactive waste disposal facilities such as the Barnwell Site in South Carolina or the Envirocare Site in Utah. The treated liquid effluent is eventually discharged into the James River in accordance with a Virginia Pollutant Discharge Elimination System permit for nonradiological contaminants and 10 CFR Part 20, Standards for Protection Against Radiation, for radiological contaminants.

Radiologically contaminated materials are cleaned for recycling, reuse, or disposal in the Decontamination Facility portion of the WTF. The decontamination process varies from wiping down materials with alcohol or cleaning solutions to aggressive techniques such as grinding. All techniques that generate airborne material use high-efficiency particulate air (HEPA) filter systems and ventilated hoods to reduce the particulate load. Material that meets free release limits is recycled, reused, or scrapped. Materials that fail to meet NRC-established release limits are disposed as low-level radioactive waste.

The Supercompactor Facility compacts solid low-level radioactive waste, which reduces the volume of material. ~~Reducing the volume of waste~~ and lowers disposal costs. Solids processed in this facility include the treatment process solids from the WTF and solids from the Decontamination Facility. After compaction, the waste is shipped to an NRC-approved and licensed low-level radioactive waste disposal facility. The variety of operations at the BWXT facility creates the potential for the release of contaminated material into the air, soil, and water. As part of its current NRC license, BWXT has implemented a program designed to keep exposures and effluent levels as low as is reasonably achievable (ALARA). The ALARA program examines the technology currently available and compares the implementation costs to the health and safety benefits. This program is implemented in BWXT design procedures so systems, processes, and facilities incorporate the ALARA concept. BWXT also has implemented a formal change control system, which requires that all proposed changes to a facility be examined for impacts to exposures or effluent levels.

Gaseous effluents from NPD radioactive material operations are treated and sampled prior to discharge through stacks. The NPD facilities contain numerous stacks. HEPA filters and scrubbers are commonly used pollution control equipment for gaseous effluents at the site. Stacks that could release radioactive material are continuously sampled. In addition, separate samples are collected each normal working day in accordance with license requirements.

Liquid wastes from the main NPD manufacturing facilities are sent to the WTF. Liquid wastes from LTC facilities are collected at the Liquid Waste Disposal Facility, where, the waste is sampled and compared to discharge limits before it is sent to the WTF.

BWXT operations produce low-level and high-level solid radioactive waste. A ~~large~~ variety of low-level radioactive solid wastes are generated from the operations at the NPD main facilities and the LTC. These solid low-level wastes are generally packaged in the area of generation and monitored for radioactivity levels. Most solid low-level radioactive waste is sent to the Supercompactor Facility for volume reduction and eventual disposal offsite. The high-level solid radioactive waste generated in the LTC is packaged in the hot cells in stainless steel drums and then transferred to (b)(4) EX4

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(b)(4)

Ex 4

BWXT also operates a comprehensive environmental monitoring program that collects air, groundwater, surface water, sediment, soil, and vegetation samples from areas in and around the site and tests them for radiological content. Requirements for the program are established by license conditions in NRC license SNM–42 and implemented by approved BWXT procedures.

1.3.3 Decommissioning

At the termination of license SNM–42, NRC will require BWXT ~~may elect~~ to decontaminate and decommission the Lynchburg facility. At that point, BWXT will develop a detailed decommissioning plan consistent with the applicable license termination criteria at the time of decommissioning and submit this plan to NRC for review and approval. To cover the costs of potential decontamination and decommissioning activities associated with the termination of NRC License SNM–42, BWXT has established a financial surety agreement in accordance with NRC regulations in 10 CFR 70.25.

2.0 ALTERNATIVES TO THE PROPOSED ACTION

No Action Alternative

If license SNM–42 is not renewed, radiological operations at the NPD would cease with the expiration of the license and decommissioning of the facilities would begin. In the short term, the environmental impacts from decommissioning would likely be similar to the impacts resulting from radiological operations, with the addition of a significant increase in waste generation.

(b)(4)

(b)(4)

Ex 4

Termination of License SNM–42, therefore, implies that fuel production would be performed at another location, and the environmental impacts would shift to that location. If a new facility were built to meet the fuel requirements, the environmental impacts would likely be greater than for an existing facility because of construction and start-up activities.

The proposed action and the no action alternative were considered to bound the likely impacts associated with the renewal of NRC license SNM–42 and were the only alternatives considered. Other reasonable alternatives are not likely to exceed these impacts or meet the need for the proposed action described in Section 1.2.

3.0 AFFECTED ENVIRONMENT

3.1 Site Description and Land Use

The BWXT facility occupies a 201-ha [497-acre] site approximately 8 km [5 mi] east of Lynchburg, Virginia, in the northeast corner of Campbell County. The site is located on a peninsula surrounded on three sides by the James River. Much of the area adjacent to the river consists of a relatively flat floodplain. Across the river to the north and west are rolling hills. The side of the BWXT site not bounded by the river is adjacent to Mount Athos, which has the highest elevation in the vicinity at 271 m [890 ft] above mean sea level. The nominal elevation of the James River is 139.6 m [458 ft] above mean sea level. Elevations on the site range from

140.2 m [460 ft] to approximately 213 m [700 ft] above mean sea level. The high point of the facility is located in the approximate center of the site. The main NPD manufacturing and support facilities occupy approximately 6.8 ha [16.8 acres] and are located towards the center of the site with the main facility at an elevation of 173 m [568 ft] above mean sea level. The LTC facilities occupy approximately 5.5 ha [13.6 acres] and are located west of the main NPD facility. The approximately 0.24-ha [0.6-acre] WTF, with an elevation of 149 m [488 ft] above mean sea level, lies north of the main NPD facility. A security fence encloses approximately 16 ha [39 acres] of the site.

The land around the BWXT facility is used for a variety of purposes. The area hosts other industrial facilities. Located southeast of the BWXT facility is the AREVA site (formerly Framatone Advanced Nuclear Power, Inc.) site, which supports commercial nuclear fuel fabrication and reactor operations under NRC License SNM–1168. The Intermet Iron Foundry, which manufactures cast-metal automotive parts, also is located on the peninsula south of the BWXT site. Other industries are located to the east in and around Lynchburg. Forestry and agriculture, however, dominate the activities in the ~~generally~~predominately rural area. The rolling hills west and north of the site are farmlands and woodlands. Northeast of the BWXT site is Joshua Falls, a recreational area that provides access to the James River. Access to the BWXT site is provided from State Route 726. This route intersects Route 460, which is the main highway connecting Lynchburg, Appomattox, and Richmond. The BWXT site also is accessible by railroad with a spur of the CSX Transportation Railroad on the property.

3.2 Demography and Socioeconomic

Located in the northeast corner of Campbell County, the BWXT site is in close proximity to three other counties: Amherst, Appomattox, and Bedford. According to the 2000 Census, 51,078 people resided in Campbell County, and 228,616 people resided in the four-county area (U.S. Census Bureau, 2004). Lynchburg, Virginia, located about 8 km [5 mi] to the west of the BWXT facility, is the population center nearest the site. The city had a 2000 Census population of 65,269 (U.S. Census Bureau, 2004). For Campbell County, the population increased 7.4 percent from 1990 to 2000, while the population of Lynchburg decreased slightly by 1.2 percent. The population of the four-county area increased by 10.9 percent from 1990 to 2000, compared to a 14.4-percent increase for the State of Virginia. The minority (nonwhite) population of the four-county area was estimated at 20.6 percent in the 2000 Census, compared to 27.7 percent for the State of Virginia (U.S. Census Bureau, 2004).

With the exception of Lynchburg, the four-county area is predominantly rural. The site is bounded on three sides by the James River and, because of the rolling terrain adjacent to the river, most of the population is located more than 4.8 km [3 mi] from the BWXT facility. In the 2000 Census, the census block that includes the facility (Block 2001, Block Group 2, Census Tract 201, Campbell County, Virginia) reported a population of 38 (U.S. Census Bureau, 2004). This census block covers an area about 5.5 km^2 [2.1 mi^2]. There are no significant population concentrations within about 3.2 km [2 mi] of the facility, and the nearest residences are about 0.8 km [0.5 mi] east-northeast (NRC, 2003b). About two-thirds of the population of 9,069 that lives within 8 km [5 mi] of the site resides west-southwest and west-northwest of the facility. This includes the easternmost portions of Lynchburg and the small community of Madison Heights (NRC, 2003b). In 2000, the vacancy rate for the four-county area was about 8.5 percent of 98,057 housing units (U.S. Census Bureau, 2004).

There are no schools or churches within 4.8 km [3 mi] of the BWXT facility, but there are several nearby businesses. These include the AREVA facility, the Archer Creek Plant of Intermet (formerly Lynchburg) Foundry, and the Central Virginia Federal Credit Union (Framatome, 2002; NRC, 2003b; BWXT, 2004b).

Based on the 2000 Census, the median household income in 1999 for the four-county area ranged from $28,792 for the city of Bedford to $43,136 for Bedford County (U.S. Census Bureau, 2004). The range is much narrower ($36,507 to $37,393) for Amherst, Appomattox, and Campbell counties; and the median household income in Lynchburg is $32,234. These incomes are below the median household income of $46,677 for the State of Virginia, but the four-county area maintained about the same proportion relative to the state household income from 1989 to 1999. The percentage of individuals with income below the 1999 poverty level was 11.4 percent for the four-county area, compared to a state poverty level of 9.6 percent. This represents a slight decrease from the poverty level of 11.6 percent reported in 1989 for the four-county area (U.S. Census Bureau, 2004).

For the four-county area, the total civilian labor force (nonfarm) in August 2004 was about 110,000, with a regional unemployment rate of about 4.3 percent (Virginia Employment Commission, 2004). The unemployment rate is slightly higher than the statewide rate of 3.7 percent, and both the regional and state unemployment rates have declined during 2003 and 2004 (Virginia Employment Commission, 2004). BWXT is a major employer in the region, with a current workforce at the Lynchburg facility of about 2,400 (BWXT, 2004b). This is consistent with recent historical employment levels that range from 1,839 workers at the time of the last license renewal in 1995 to 2,579 employees reported in 1991 (NRC, 1995a, 1991). An additional 600 workers are employed at the Intermet, AREVA, and the Central Virginia Federal Credit Union facilities near the BWXT site (Framatome, 2002; NRC, 2003b; BWXT, 2004b).

3.3 Climatology, Meteorology, and Air Quality

The climate of the Lynchburg, Virginia, area is influenced by cold and dry polar continental air masses in the winter and warm and humid gulf maritime air masses in the summer. The mean annual temperature is about 13.0 °C [55.4 °F] with normal average temperatures ranging from 23.9 °C [75.1 °F] in July to 1.4 °C [34.5 °F] in January (National Oceanic and Atmospheric Administration, 2001a). The annual mean rainfall for Lynchburg is 110.0 cm [43.3 in] (National Oceanic and Atmospheric Administration, 2001a). The monthly rates of rainfall are nearly uniform except for a slightly higher rate from May to July. Snowfall in the Lynchburg area generally occurs from December to March, with a mean yearly snowfall total of 47.2 cm [18.6 in] (National Oceanic and Atmospheric Administration, 2001b). From 1930 to 1996, winds were predominately from the southwest with a mean speed of 11.3 km/hr [7.0 mph] (National Oceanic and Atmospheric Administration, 1998). During this same period, the maximum monthly mean wind speed was 14.5 km/hr [9.0 mph], and the maximum peak speed was 119.1 km/hr [74.0 mph] (National Oceanic and Atmospheric Administration, 1998). Data obtained from the National Oceanic and Atmospheric Administration (2004a) indicate that, from 1964 to 2003, the mean relative humidity values were 80 percent in the morning and 53 percent in the afternoon.

Extremes in weather conditions in the area are rare. Severe weather at the site is generally limited to thunderstorms, with a low probability of tornadoes. Data obtained from the National Oceanic and Atmospheric Administration (2004b) show that the mean number of storm events classified as "thunderstorm and high-wind" occurring in Campbell County, Virginia was about

four per year from 1994 to 2003. The thunderstorm and high wind classification is reserved for more extreme storm events that can include severe thunderstorms, damaging winds, or hail.

From 1950 to 1995, an average of 6 tornadoes per year occurred in the state of Virginia, occurring at a rate of about 6.2×10^{-5} tornadoes per year per km^2 [1.6×10^{-4} tornadoes per year per mi^2] (Lott, et al., 2000). Of those tornadoes, two per year would be classified in the "strong-violent" category. Tornadoes with a rating on the Fujita Tornado Damage Scale between F2 and F5 are considered "strong-violent" (Lott, et al., 2000). An increase in the Fujita Tornado Damage Scale number represents an increase in tornado severity. In the 46-year period from 1950 to 1995, only one tornado in Virginia was categorized higher than F3 (National Oceanic and Atmospheric Administration, 2004c).

~~Air quality for the region of the BWXT site is good. Several regulations govern air quality issues. The National Ambient Air Quality Standards (NAAQS) regulate six common pollutants: nitrogen oxides, ozone, sulfur oxides, carbon monoxide, lead, and total suspended particulates. Areas are classified as in attainment if the pollutant concentration levels are lower than the established NAAQS standards.~~Air quality at BWXT is regulated for nonradiological emissions by the Virginia Department of Environmental Quality and for radiological emissions by NRC. Regulations that apply to air pollutant control include 40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards; 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants; and 10 CFR Part 20, Standards for Protection Against Radiation.

The National Ambient Air Quality Standards (NAAQS) define the acceptable levels for six common nonradiological pollutants: nitrogen oxides, ozone, sulphur oxides, carbon monoxide, lead, and total suspended particles. Compliance is attained when pollutant concentration levels are lower than the established NAAQS standards.

Campbell County is in attainment for all six of these pollutants (BWXT, 2004b). The National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulates hazardous chemicals. These pollutants are normally associated with particular industrial sources or activities. Nonradiological emissions are reported annually to the Virginia Department of Environmental Quality as required by the Title V operating permit (effective February 16, 2002) (BWXT, 2004b). Included in this report are emissions related to the NAAQS pollutants and three other compounds: ammonia, hydrochloric acid, and hydrofluoric acid. These air emissions are estimated based on process throughputs and engineering knowledge. The operating permit limits the amount of throughput for certain industrial processes in order to control the amount of air pollutants generated. For the 4-year period from 2000 to 2003, no regulated process ran at more than about 25 percent of the permitted operating level (BWXT, 2004b). Most processes at BWXT have no limits other than opacity or the lack of visible emissions. BWXT has not exceeded the opacity limit since the February 16, 2002, effective date of the Title V permit (BWXT, 2004b).

Radiological emissions are regulated by NRC under 10 CFR Part 20, Standards for Protection Against Radiation and by the U.S. Environmental Protection Agency (EPA) under 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants. BWXT collects air samples at thirteen site boundary locations to determine the levels of radiological airborne discharge. For the 10-year period from 1994 to 2003, the maximum concentration for any of the locations was 2.5 percent of the 10 CFR Part 20 limit. BWXT also directly monitors radiological airborne discharges from the various stacks and calculates an offsite dose from the combined

emissions. For the 9-year period from 1995 to 2003, the highest offsite dose was determined to be 1.8 percent of the 0.1 mSv/yr [10 mrem/yr] limit described in 10 CFR 20.1101.

3.4 Hydrology

3.4.1 Surface Water

The BWXT facility is situated in a meander bend within the middle reaches of the James River. The James River flows generally east-southeast from the Blue Ridge Mountains through the Piedmont Province of Virginia to the Atlantic Ocean, draining about 20 percent of the northern areas of Campbell County, including the BWXT facility site. Surface water flow at the BWXT facility site is approximately to the north-northeast, comprising mainly drainage from rain events. There are no natural ponds or lakes within the BWXT facility, but several retention ponds have been built for stormwater detention and effluent storage. Flooding occurs infrequently in the James River. Since 1771, there have been 11 major flood events, the most recent being in 1996 (BWXT, 2004b). The BWXT facility site contains several small, isolated wetlands primarily located within the floodplains of the meander bend.

Previously, BWXT withdrew water directly from the James River for industrial purposes, but in August 2003, the site switched to a public water supply from the Campbell County Utilities Service Authority. The BWXT facility discharges treated waste water into the James River through three outfalls. Outfall 001 discharges directly into the James River, while outfalls 002 and 003 discharge into ditches that flow into the James River. These discharges are regulated for nonradioactive contaminants under the Virginia Pollutant Discharge Elimination System (Permit No. 00367) and for radiological contaminants under 10 CFR Part 20. The James River is currently not designated for drinking water (BWXT, 2004b).

3.4.2 Groundwater

Groundwater in the Middle James River watershed occurs in crystalline bedrock and in the overlying unconsolidated sediment. At the BWXT facility site, groundwater flows northeast toward the James River. Prior to converting to the public water supply, BWXT withdrew groundwater from seven onsite wells for process applications and employee consumption (BWXT, 2004b).

Groundwater at the site has been contaminated from past operations. In 1986, BWXT identified volatile organic compounds (VOCs) in the groundwater system adjacent to the James River. EPA Region 3 issued a Consent Order in 1991 for BWXT to perform corrective action in accordance with the Resource Conservation and Recovery Act (RCRA). EPA Region 3 ~~Government Performance and Results Act RCRA Corrective Action Baseline Facilities~~ documents the monitoring and corrective action implemented (EPA, 2004a). The BWXT baseline monitoring indicates that (i) there are no unacceptable human health risks at the site, (ii) the migration of contaminated groundwater at the site has stabilized, and (iii) groundwater discharges to surface water are currently acceptable (EPA, 2004b). With EPA approval, several monitoring wells have been installed at the site, and observations are reported annually to EPA Region 3. Two remediation technologies are in operation at the site: a soil vapor extraction system for the removal of VOCs from soils and a groundwater pump and treatment system. BWXT and EPA have agreed to a long-term alternative screening study of these two active corrective action technologies.

In 2001, BWXT discovered more VOCs at another location. The source of these chemicals was a landfill formerly used for the disposal of solids generated from the treatment of industrial waste water. Although field studies indicate that the groundwater plume from this landfill does not intersect the James River, the associated monitoring wells have been included in the site annual sampling program.

3.4.3 Wetlands

The Clean Water Act gives the U.S. Army Corps of Engineers jurisdiction to protect and regulate wetlands that are classified as "waters of the United States." As depicted on the Department of the Interior Wetland Inventory Map (U.S. Fish and Wildlife Service, 2004a), 13 wetland areas are located on the site. Nine of the 13 wetland areas are located within the 100-year floodplain and would be considered jurisdictional by the U.S. Army Corps of Engineers and subject to protection under Section 404 and the Clean Water Act. The remaining four areas are not considered jurisdictional and are used for plant operations.

3.5 Geology and Seismology

The site is located at the western edge of the Piedmont physiographic province. Surficial deposits at the site consist of Quaternary age alluvium and Quaternary age or older terrace gravels. Bedrock at the site consists of a micaceous schist, a phyllite member of the Chandler formation, and a graphite schist member of the Archer Creek Formation. Both of these formations are Paleozoic metamorphic rocks of the Evington Group. Soils at the site have been identified as Culen-Wilkens. The moderately deep, well-drained, and gently sloping to steep soils have a dominantly clay subsoil (NRC, 1995a).

The site falls within the western part of the Central Virginia Seismic Zone (Wheeler, 1998). Between 1774 and 1994, there were 18 earthquakes in Virginia reported as having a Modified Mercalli Intensity of VI or higher. The Modified Mercalli Intensity scale indicates the shaking severity of an earthquake. An increase in the Modified Mercalli Intensity number represents an increase in earthquake severity. The largest historical earthquake occurred in 1897. It was located 161 km [100 mi] west of the site and had a Modified Mercalli Intensity of VIII (NRC, 1995a; Virginia Department of Mines, Minerals, and Energy, 1994). The site has a 10-percent probability of exceeding a peak ground acceleration of 0.035g (the force of gravity) and a 2-percent chance of exceeding a peak ground acceleration of 0.113g in a 50-year period (Frankel, et al., 1997).

3.6 Ecology

3.6.1 Terrestrial

The native vegetative climax community in the Lynchburg/Campbell County area is an oak-hickory-pine (*Quercus-Carya-Pinus*) forest. Unimproved portions of the BWXT site are comprised of secondary secession forests and grasslands (BWXT, 2004b). Forested wetlands and emergent herbaceous wetlands are located within the 100-year floodplain adjacent to the James River.

According to the Virginia Department of Game and Inland Fisheries (Virginia Fish and Wildlife, 2004), there are 492 species known or likely to occur within a 6.4-km [4-mi] radius of the

BWXT facility. The animals consist of more than 50 mammal, 35 reptile, 17 amphibian, 74 invertebrate, and approximately 243 bird species.

3.6.2 Aquatic

There are approximately 72 species of fish known or likely to occur in a 6.4-km [4-mi] radius of the BWXT facility. The James River has an aquatic community characteristic of a moderately polluted river. Fish common to the site vicinity include large mouth bass, blue gills, and shiners. The benthic community of the James River near the BWXT facility is common to both flowing and back water systems (NRC, 1995a).

3.6.3 Threatened and Endangered Species

According to the U.S. Fish and Wildlife Service (2004b), the State of Virginia has 50 listed threatened or endangered animal species, including 4 believed to be no longer found in Virginia. In addition, there are 17 threatened or endangered plant species, with one species believed to be no longer found. According to the information obtained from the Virginia Department of Game and Inland Fisheries (Virginia Fish and Wildlife, 2004), there are 2 federal threatened or endangered animal species with the potential to occur within a 6.4-km [4-mi] radius of the BWXT facility if the correct habitat is found. These species are the James spinymussel (*Pegias fibula*) and Bald eagle (*Haliaeetus leucocephalus*). Eight state-threatened or endangered animal species were noted with the potential to occur within a 6.4-km [4-mi] radius of the facility. These species were identified as the Loggerhead shrike (*Lanius ludovicianus*), Carolina darter (*Etheostoma collis*), Atlantic pigtoe (*Fusconaia masoni*), Henslow sparrow (*Ammodramus henslowi*), Peregrine falcon (*Falco peregrinus*), Upland sandpiper (*Bartramia longicauda*), James spinymussel, and Bald eagle (Virginia Fish and Wildlife, 2004).

According to the Virginia Department of Natural Heritage (Virginia Department of Conservation and Recreation, 2004), there are one federal threatened or endangered plant and two State-listed threatened or endangered plant species located within the general area of the BWXT facility site. The Smooth coneflower (*Echinacea laevigata*) appears on both Federal and state lists. The Nestronia (*Nestronia umbellula*) is the other plant on the state list.

3.7 Historical and Cultural Resources

The BWXT facility is located in the Piedmont region off the Blue Ridge Mountains. The Piedmont region along the James River was inhabited for thousands of years by various Native American tribes, including the Manahoacs, Monacans, Occaneechis, and Saponis. The arrival of European settlers occurred in the late 16th to early 17th centuries. The city of Lynchburg was founded on the banks of the James River in the late 18th century. By the early 19th century, the agricultural development of the area thrived, with tobacco production providing major economic growth. By the early 20th century, the economic base of Lynchburg shifted from agriculture to manufacturing. A large number of diverse factories became established in the area, which presently include industries related to communications, paper, machinery, and nuclear energy.

Within the four-county area (Amherst, Appomattox, Bedford, and Campbell) surrounding and containing BWXT, there are a number of culturally significant sites listed on the National Register of Historic Places. None of these sites are located within the BWXT boundaries;

however, two of the listed sites, the Norfolk Southern 6-Mile Bridge No. 58, which crosses the James River north of BWXT, as well as the ruins of the Mt. Athos Mansion and Plantation, are within 4.8 km [3 mi] of the BWXT facility (BWXT, 2004b). The ruins of the Mt. Athos Plantation are located east of BWXT. Constructed in 1796 and originally known as the Buffalo Lick Plantation, the Mt. Athos manor house was destroyed by fire in 1876, and the plantation property was later subdivided into private ownership. The National Register site currently includes the ruins of the manor house, grave sites, a tobacco barn, and stone cisterns. The 9-Mile Bridge located northeast of the facility has been determined eligible for listing on the National Register.

Remains of the Kanawha Canal exist on BWXT property and are located north of the railroad tracks and facility structures (BWXT, 2004b). The canal was constructed in the early 19th century to facilitate the exportation of area agricultural products (e.g., tobacco and wheat). During the Civil War, the canal was used by Confederate troops to transport war materials. Six archaeological sites (44CP87–92) associated with the James River and Kanawha Canal are located on BWXT property[1] (BWXT, 2004b). These site are generally found adjacent to the river. The significance of these resources has not been evaluated, but other features associated with the canal have been determined eligible for listing on the National Register of Historic Places.

Two prehistoric sites are located in the vicinity of the BWXT property: Site 44CP22, located within the neighboring AREVA facility, and Site 44CP5, located along the railroad tracks north of the BWXT facility.[2] The significance of these sites has not been evaluated.

Normally, a site must be at least 50 years old in order to be considered for entry into the National Register of Historic Places (National Park Service, 2004). BWXT has been operating a nuclear related facility in the Lynchburg area since 1955. Elements of the facility that date to the earliest period of operation, therefore, should be considered eligible for listing on the National Register of Historic Places.

3.8 Noise

Noise from site operations is limited (BWXT, 2004b). Most operations are conducted indoors, so the greatest contributors to environmental noise are automobiles and building ventilation systems. The distance from the buildings to the site boundary helps mitigate any offsite noise impacts from the operation of the ventilation systems.

3.9 Waste

BWXT operations produce ~~gaseous~~airborne, liquid, and solid effluents. ~~Gaseous~~Airborne effluents are normally ~~sent through~~treated by HEPA filters or scrubbers before being discharged through one of the stacks. Nonradiological gaseous emissions are dominated by nitrogen oxides and volatile organic compounds. In 2003, an estimated 44.54 metric tons [49.10 tons] of

[1]Kirchen, R.W. Letter (March 9) to J. Davis, NRC. "Comments on Docket No.: 70-27 Renewal of NRC License for BWX Technologies, Inc. DHR File No. 2003-0590." Richmond, Virginia: Commonwealth of Virginia, Department of Historic Resources. 2005. (Official Use Only)

[2]Ibid.

nitrogen oxide and 16.39 metric tons [18.07 tons] of volatile organic compounds were emitted from the BWXT facility (BWXT, 2004b). Liquid effluents from the NPD and LTC facilities are treated at the WTF and discharged into the James River in accordance with Virginia Pollutant Discharge Elimination System and 10 CFR Part 20 requirements. For the 10-year period from 1994 to 2003, the average amount of water discharged annually through the three BWXT outfalls was 823.3 million L [217.5 million gal]. The highest amount was discharged in 1998 with a value of 998.6 million L [263.8 million gal] (BWXT, 2004b). BWXT operations produce low-level and high-level radioactive solid waste. For the 4-year period from 2000 to 2003, an average of 825.2 m^3 [29,142 ft^3] of low-level radioactive solid waste was generated. The highest amount of this waste was generated in 2000 with a value of 1,217.6 m^3 [42,999 ft^3] (BWXT, 2004b). The low-level radioactive solids are stored in 208-L [55-gal] drums. Usually, these drums are sent to the Supercompactor Facility on site, crushed, and repackaged into 265-L [70-gal]-overpack drums. All drums containing low-level radioactive waste are sent offsite for disposal at ~~locations~~licensed disposal facilities (e.g., the Barnwell Site in South Carolina and the Envirocare Site in Utah). For the 4-year period from 2000 to 2003, high-level radioactive solid waste was generated in only two of the years. In 2000, 1.8 m^3 [63 ft^3] was generated, and in 2001, 1.6 m^3 [57 ft^3] was generated (BWXT, 2004b). High-level radioactive solid wastes are stored in stainless steel drums (b)(4) (b)(4) high-level waste is retained onsite. (b)(4) BWXT is negotiating with the U.S. Department of Energy concerning the ultimate disposition of this waste. Ex 4 Ex 4

Nonradioactive hazardous waste is also generated from BWXT operations. The Virginia Department of Environmental Quality requires BWXT to prepare a biennial hazardous waste generator report (BWXT, 2004b). This report lists all hazardous waste streams and identifies all disposal methods. Normally, the hazardous wastes are collected at satellite accumulation areas within the facility. The waste is eventually transferred to the NPD Hazardous Waste Building where it is inventoried, documented, and prepared for offsite shipment.

Approximately 0.3m^3/yr [10.6 ft^3/yr] of mixed wastes also are generated from the BWXT operations. The majority of this waste is radioactive trichloroethylene. This waste is packaged and shipped offsite for disposal.

BWXT operations produce solid waste that is ~~nonradioactive and nonhazardous~~not contaminated with constituents regulated as radioactive or hazardous wastes. Occasionally, BWXT disposes a small portion of the noncontaminated inert material onsite. This material consists primarily of broken concrete and is used as fill at construction locations. The Virginia Solid Waste Management Regulations allow this practice. A conservative estimate of the amount of this material generated and disposed onsite is 30.6 m^3/yr [40 yd^3/yr].

3.10 Public and Occupational Health

The continued handling of materials and conduct of NPD operations pose a potential impact to public and occupational health. For normal operations, the impacts are related to the release of low levels of toxic or radioactive materials to the environment over extended periods of time. For accident conditions, the hazard may involve releasing higher concentrations of materials over relatively short periods of time.

3.10.1 Background Radiological Characteristics

The average total effective dose equivalent to a person living ~~anywhere~~ in the United States from natural background sources of radiation is approximately 3 mSv/yr [300 mrem/yr] (BWXT, 2004b). This dose comes from exposure to cosmic radiation, cosmogenic radionuclides, terrestrial radionuclides, inhaled radionuclides, and radionuclides naturally occurring in the body. On average, an additional total effective dose equivalent of approximately 0.6 mSv/yr [60 mrem/yr] derives from anthropogenic sources such as medical diagnostic tests and consumer products (BWXT, 2004b). The background radiological characteristics of the BWXT site were first evaluated as part of a preoperational environmental monitoring program conducted in 1956 and were found to be ~~typical for the United States~~comparable to the aforementioned U.S. average (NRC, 1995a). BWXT continues to monitor background radiation levels through a comprehensive environmental monitoring program.

3.10.2 *Public Health and Safety*

The primary risk to public health and safety from NPD operations is exposure to radioactivity associated with examining and handling nuclear fuel assemblies and managing associated effluent streams. Radioactive materials released from NPD facilities may ~~reach the public~~migrate in the environment through a variety of transport pathways, contributing to public exposures from both internal and external exposure pathways. For atmospheric releases, internal exposures may occur through inhaling radioactive material dispersed in the air or ingesting crops and animal products that come in contact with radioactive material deposited from the air. External exposures may occur through direct radiation from an airborne plume or from particulates deposited on the ground from the plume. For liquid releases, internal exposures from ingesting water or irrigated crops may occur. External exposures from recreational activities, including swimming and boating, may occur.

NPD operations release small amounts of radioactive material to the atmosphere from numerous stacks. The NPD main manufacturing facilities primarily release uranium, while the LTC releases mixed fission products, including tritium and krypton (NRC, 1995b). Prior to discharge into the James River, low-level liquid radioactive waste from NPD operations is processed through the WTF to meet 10 CFR Part 20 effluent ~~radiological limits, and the effluent is~~. Releases attributable to the NPD main manufacturing facilities are primarily uranium, while those from the LTC are primarily tritium (NRC, 1995b). Radiological doses associated with NPD operations are dominated by liquid effluent releases to the environment. For the 6-year period from 1998 to 2003, the average total effective dose equivalent for the maximally exposed member of the public received from the combined effluent releases from all NPD operations were estimated as 3.5×10^{-3} mSv/yr [3.5×10^{-1} mrem/yr] (BWXT, 2004b). The highest annual total effective dose equivalent occurred in 2001 with a value of 6.5×10^{-3} mSv/yr [6.5×10^{-1} mrem/yr] (BWXT, 2004b). This dose was primarily a result of liquid effluent releases associated with normal operations of these facilities and is a small fraction of the NRC 1.0 mSv [100 mrem] annual dose limit for individual members of the public ~~established by NRC~~ in 10 CFR 20.1301.

3.10.3 Occupational Health and Safety

Risks to occupational health and safety include exposure to industrial hazards, hazardous materials, and radioactive materials. Industrial hazards for the NPD facilities are typical for an industrial facility of this size and include ~~working with chemicals, tripping, being cut on~~

~~equipment or material, lifting or dropping heavy objects, and catching clothing on moving machine parts~~ chemical exposures, heavy machinery accidents, crush injuries, and cuts and abrasions. These hazards are experienced by workers associated with the material processing operations, as well as by those conducting monitoring, research, general office, and industrial site activities. The average NPD Occupational Safety and Health Administration (OSHA) incident rate from fiscal year 2000 to fiscal year 2003 is 2.20 (BWXT, 2004b). The OSHA incident rate has become a standard for measuring and comparing work injuries, illnesses, and accidents within and between industries. The incident rate accounts for both the number of OSHA recordable injuries and illnesses and the total number of man-hours worked. Average incident rates are calculated for various industry classifications because the incident rate can vary based on the nature of the work. The average incident rate for the classification of industry applicable to facilities like BWXT is 7.3 (BWXT, 2004b).

The NPD facilities handle nonradiological materials that could pose a risk to worker health and safety through chronic exposure or improper handling. The list of hazardous chemicals used in operations includes chromium compounds, cobalt compounds, copper compounds, hydrochloric acid, hydrogen fluoride, nickel compounds, nitric acid, sulfuric acid, and trichloroethylene. The BWXT Industrial Hygiene Program addresses monitoring for industrial exposures to nonradiological chemicals. Existing operations have been monitored for potential exposure and new chemicals and operations are identified and monitored in the facility Change Management Program.

Radiation exposure from normal operations is primarily due to inhaled radioactive material during the fuel fabrication process. A radiation protection plan is maintained in accordance with 10 CFR Part 20 to ensure that radiation doses are maintained below NRC limits and are ALARA. Radiological impacts to workers will result from fabrication, assembly, recovery, research operations, and other activities ~~such as performing radiation surveys, performing preventive and corrective maintenance and surveillance activities, and routine security patrols~~. For the 5-year period from 1999 to 2003, the average total effective dose equivalent for the maximally exposed NPD worker was 13.18 mSv/yr [1,318 mrem/yr] (BWXT, 2004b). The highest annual total effective dose equivalent occurred in 2000 with a value of 20.07 mSv/yr [2,007 mrem/yr] (BWXT, 2004b). For the 5-year period from 1999 to 2003, the average total effective dose equivalent for the maximally exposed LTC worker was 16.59 mSv/yr [1,659 mrem/yr] (BWXT, 2004b). The highest annual total effective dose equivalent occurred in 2000 with a value of 22.31mSv/yr [2,231 mrem/yr] (BWXT, 2004b). These doses are below the NRC 50 mSv [5,000 mrem] annual occupational dose limit in 10 CFR 20.1201.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

The proposed action is for a license renewal of the existing BWXT facility. No changes to facilities or operations are associated with this renewal. The level of activity for the various operations changes over time, which can result in fluctuations in the amount of effluents. The evaluation of the environmental impacts of the license renewal, however, can be based on the impacts from past and current operations. The short-term impact for the no action alternative would result from closing the facility and from the decommissioning activities associated with license termination. The long-term impact for the no action alternative would depend on the ~~level of decontamination achieved at decommissioning. This would dictate the available options for land use. One possibility is for the land to be released for unrestricted use~~ license

termination approach chosen by BWXT. This approach would dictate whether the land is released for restricted or unrestricted use based on the level of decontamination achieved.

4.1 Nonradiological Impacts

No change in impacts ~~because of~~from the proposed action on land use are anticipated ~~for land use~~. The various facilities at the BWXT site already exist and are operating. No plans exist to expand facilities at the site. Future expansion within the industrial portion of the site is likely, however. The no action alternative would have an impact on land use. In the short term, decommissioning activities could require areas within the site for equipment, waste, and decontamination.

No change in impacts due to the proposed action are anticipated from the transportation routes to the site. The quantity and type of shipments to the site are anticipated to continue at present levels, so the proposed action would not cause an increase in traffic or require expanding the infrastructure. The short-term impact for the no action alternative would be a significant increase in amount of material shipped offsite as a result of decommissioning activities.

Because no new work activities are proposed, the proposed action to renew License SNM–42 would not have a significant socioeconomic impact on the region. BWXT would continue to directly employ about 2,400 workers, representing about 2–3 percent of the regional civilian labor force. There is sufficient available housing to meet likely fluctuations in the BWXT work force. Impacts from the no action alternative are potentially significant. The expiration of the *license would require closing the BWXT facility and eliminate the need for a work force of 2,400.* Many of the work requirements at the BWXT facility are specialized, and it is unlikely that a sufficient number of similar positions would be found to replace these jobs in the local economy. Decommissioning activities would continue to provide some employment for a period of time, but these activities would likely require a significantly reduced work force that would no longer be needed upon completing the decommissioning of the site.

No change in impacts to the air quality from nonradiological contaminants are anticipated because of the proposed action. Without changes to the facilities or operations, the type of contaminants produced at the site would not change. NPD emission quantities vary over time but current levels are well below applicable limits. The short-term impact for the no action alternative could be an increase in emissions, especially for particulate matter, associated with decommissioning activities.

No change in impacts to water quality is anticipated because of the proposed action. In August 2003, BWXT converted to a public water supply, thus eliminating the need for withdrawals from the James River. The impact of BWXT operations no longer includes the disruption of flow of the James River and the drawdown of the local water table. Potential surface water impacts associated with operation of the BWXT facility include the degradation of James River water quality due to contaminant release. This potential impact is minimized by compliance with the discharge limits outlined in the Virginia Pollutant Discharge Elimination System permit. Current effluent quality characteristics are well within the permit limitations (BWXT, 2004b). Potential groundwater impacts include the degradation of groundwater quality due to contamination caused by leaks or spills of material into the soil. This potential impact is minimized by implementing engineering controls such as equipment designed to contain spills. Administrative controls (e.g., routine leak inspections) also are used to minimize the potential

impact. With the corrective actions and monitoring programs currently in effect, continued operations at the BWXT facility should not result in additional negative impacts on the local groundwater system. No filling or other impact to identified jurisdictional wetlands or "waters of the U.S." is expected as a result of the current operation of the BWXT facility.

The site geology and soils will not be impacted by the proposed action because no changes to the land are associated with the license renewal. The presence of vegetation and maintenance of the facilities, parking lots, and roadways helps control erosion at the site. Decommissioning activities associated with the no action alternative may have a short term impact on the site surficial geology.

Site ecology would not be affected by the proposed action. Impacts to native flora and fauna, including those on the Federal and state threatened or endangered species lists, are unlikely.

The proposed action would not result in any additional impacts to the regional historic and cultural resources because the facility already exists, and no expansion or change of activity is associated with the license renewal. In the short term, the decommissioning activities associated with the no action alternative may have historical and archeological impacts within the BWXT site. Facility structures, some of which are 50 years of age or older and considered potentially eligible for listing on the National Register of Historic Places, might be removed. Furthermore, areas not previously disturbed, which may contain potentially significant archaeological resources, may be impacted by decommissioning activities.

No change in impacts to noise levels is anticipated because of the proposed action because currently no plans exist that would result in a noise level change. The short-term impact for the no action alternative might be an increase in noise levels if the decommissioning included demolition of facilities.

No change in impacts to nonradiological waste management is anticipated because of the proposed action. The BWXT facility would continue to generate and handle wastes in a manner consistent with past operations. Nonradiological waste disposed onsite is limited to small quantities of fill material occasionally used during construction activities. Because this material is inert, no environmental impacts are expected. The short-term impact for the no action alternative would be an increase in the quantity of waste associated with decommissioning the facility.

The proposed action is not expected to change nonradiological impacts to public and occupational health, because no changes in facilities or operations are associated with the license renewal.

4.2 Radiological Impacts

~~A detailed safety review will be conducted by the NRC in response to the BWXT request for license renewal. The review will evaluate radiological impacts from normal operations and accident scenarios. Some of the issues examined will be site security, material control, accounting, and potential aircraft crashes. The results of this detailed review will be documented in a separate safety evaluation report.~~

4.2.1 Normal Operations

No change in impacts to the air quality from radiological contaminants is anticipated because of the proposed action. The types of radiological contaminants produced at the site would be similar to the past with some fluctuation in quantities due to variations in operations. NPD radiological releases are within applicable regulatory limits of 10 CFR Part 20 (BWXT, 2004b).

No change in impacts to water quality is anticipated because of the proposed action. Water quality can be negatively impacted by the release of radioactive material into surface water and groundwater. The levels of radioactive material released into the surface water are below discharge limits in 10 CFR Part 20 (BWXT, 2004b). Groundwater monitoring for radiological material has indicated that BWXT operations have not had a significant impact (BWXT, 2004b).

No change in impacts from low-level and high-level radiological waste management is anticipated because of the proposed action. The BWXT facility would continue to generate and handle these radiological wastes consistent with past operations. Low-level waste would be sent offsite for disposal, and high-level waste would be stored (b)(4) Ex4 (b)(4) Potential impacts from mixed waste may be lessened because of reduced amounts stored onsite. According to the previous environmental assessment (NRC, 1995a), mixed waste was accumulated onsite because no licensed commercial facilities were available for disposal of this material. Currently, BWXT ships mixed waste offsite to a licensed commercial facility.

The proposed action is not expected to result in any change in radiological impacts to public and occupational health. The dose for the maximally exposed individual of the general public is a small fraction of the NRC 1.0 mSv [100 mrem] annual limit ~~established by NRC~~ in 10 CFR 20.1301 and indicates that facility operations will have ~~in~~no significant impact on public health and safety (BWXT, 2004b). Occupational exposures also are maintained below the NRC limit of 50 mSv/yr [5,000 mrem/yr] specified in 10 CFR 20.1201 (BWXT, 2004b).

4.2.2 Accidents

[Note: Accident scenarios and impacts for this environmental assessment will be coordinated with the NRC technical project manager to ensure consistency with the safety evaluation report being prepared concurrently. This section will be modified to include feedback from the NRC staff.]

NRC is performing a detailed safety review of the BWXT facility. This review, including consideration of potential accident scenarios, consequences, and compliance with NRC regulations, will be documented in a separate safety evaluation report.

Within the NPD facilities, materials are handled that could pose a risk to public health and safety if released during accidents. ~~There are six process areas in which credible fire scenarios could lead to radiological releases outside the restricted area in excess of 10 CFR 70.61 requirements. The concern focuses on the 24-hour average release levels of radioactive material into the air from these scenarios. Uranium recovery processes account for three of the six fire scenarios. These uranium recovery processes are the main extraction and drum dryer process, the 2" extraction process, and the 3" extraction process (BWXT, 2003a,b,c). In each case, fires caused by the ignition of combustible liquids could result in the airborne release of~~

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~~uranium. The research test reactor and targets fuel powder and compact process provides the fourth fire scenario (BWXT, 2003d). The crushing of fuel buttons during the powder fabrication process creates uranium materials that are pyrophoric and combustible due to their size range. The Atomic Energy of Canada Limited target fabrication process provides the fifth fire scenario (BWXT, 2003e). In this process, the uranium fuel is handled in an inert atmosphere within a glove box to prevent combustion. Disruption of the inert atmosphere could initiate a fire. The LTC hot cells are the sixth process area where fires could release radiological material into the air that exceeds regulatory limits (BWXT, 2003f). Several ignition sources are present in the hot cells. Activities within the hot cells can generate potentially pyrophoric material such as the zirconium fines produced by cutting fuel rods for sample evaluation.~~An accident scenario may result in releasing a higher concentration of material over a shorter time period relative to releases associated with normal operations. In accordance with NRC regulations in 10 CFR Part 70, BWXT has conducted an integrated safety analysis of the Lynchburg facility. The integrated safety analysis identifies hazards, and estimates likelihood, and potential consequences. The controls used to limit, prevent, or mitigate potential accidents are also identified. Hazards examined include radiological, nuclear criticality, fire, and chemical.

The results of the integrated safety analysis are documented in an integrated safety analysis summary and a series of safety analysis reports. In general, safety analysis reports are written for each major area or operation. These documents are classified as proprietary or confidential. Only a portion of the safety analysis reports were made available to staff preparing this environmental assessment. (b)(4) (b)(4) Ex 4

4.3 Cumulative Impacts

The NRC staff has evaluated whether cumulative environmental effects could result from the incremental impacts of the SNM-42 license renewal for the BWXT facility when added to relevant past, present, or reasonably foreseeable future actions in the area. The relevant other actions include the past, current, and future operation of the BWXT facility (under a renewed license) and the continued operation of the nearby AREVA facility. No significant cumulative effects were identified for the areas discussed as the affect environment. The BWXT facility is in compliance with relevant environmental standards and regulations and NRC regulations. Further, the facility uses a formal ALARA program, routine environmental and radiation monitoring, and other planning and management measures to minimize the associated direct, indirect, and cumulative effects (BWXT, 2003g).

4.5 Monitoring

BWXT monitors for the presence of contamination in the facility effluents and the environment in and around the site to assess impacts on health and to comply with various regulations and requirements. Samples are collected from the air, groundwater, surface water, sediment, soil, and vegetation. Collection frequency and action levels differ for the various sample types. Responses to sample results that exceed action levels include investigation, further sampling, corrective action, and notification to the regulatory agency, if required. Typical corrective actions include the repair, replacement, cleaning, modification, or addition of equipment (BWXT, 2002).

Air samples are analyzed for nonradioactive and radioactive contaminants. The Title V permit regulating nonradiological air pollutants does not require facility stacks to be physically sampled for analyses. The stacks are observed on a weekly basis for any visible emissions or opacity. If visible emissions are observed, a sample is collected for an official opacity determination, and the results are compared to the limits in the operating permit. The monitoring for radiological contaminants at the point of emission varies from continuous to daily based on the particular stack or activity. Air samples for radiological analyses are collected from four boundary locations on a weekly basis.

Water samples are analyzed for nonradioactive and radioactive contaminants, and the WTF liquid effluent is monitored for several nonradioactive parameters ~~such as pH~~. The monitoring frequency varies by parameter and ranges from continuous to quarterly. The details are specified in the Virginia Pollutant Discharge Elimination System permit. Composite samples from the WTF liquid effluent are analyzed for alpha and beta/gamma radiological contamination on both a daily and monthly basis. Other water samples from groundwater, surface water, and various ponds and pools within the facility are collected and analyzed for radiological contaminates. The monitoring frequency varies from monthly to yearly and is specified for each location in the license. The majority of the site stormwater from industrial areas discharges through outfalls 002 and 003. The Virginia Pollutant Discharge Elimination System permit requires annual sampling for these outfalls for several nonradioactive parameters. The Virginia Pollutant Discharge Elimination System permit also requires BWXT to maintain an approved Storm Water Pollution Prevention Plan that covers industrial activity throughout the site.

Sediment, vegetation, and soil samples are analyzed for alpha and beta/gamma contamination. Samples are collected on a semi-annual basis (except for a few soil samples that are collected quarterly) as required by the license.

Radiation monitors (thermoluminescent dosimetries or equivalent) are used for continuous monitoring around the LTC boundary.

5.0 AGENCIES AND PERSONS CONSULTED

In accordance with NUREG–1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs (NRC, 2003a), the NRC staff consulted with other agencies regarding the proposed action. These consultations were intended to provide other agencies an opportunity to comment on the proposed action and to ensure that the requirements of Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act were met with respect to the proposed action.

5.1 State of Virginia

[Note: Text of the section will be completed following receipt of response to the NRC consultation letter.]

5.2 Virginia Department of Historic Resources

On XXX (NRC to provide date), the NRC staff discussed its preliminary findings with XXX (NRC to provide contact name) of the Virginia Department of Historic Resources (DHR). On XXX (NRC to provide date), the NRC staff provided a copy of the draft environmental assessment for this proposed action to DHR for review and comment. Certain security-sensitive and proprietary information was redacted from the draft as necessary. DHR provided its comments on the redacted draft environmental assessment in a letter.[3] The following discussion summarizes the DHR major comments and provides the NRC staff responses.

Comment: The DHR archival records indicate that several historic and archaeological resources are recorded within or adjacent to the subject property.

Response: As noted by DHR, six archaeological sites (44CP87–44CP92) associated with the James River and the Kanawha Canal are located on BWXT property. These sites are expected to be located between the CSX railroad tracks and the river. In addition, a prehistoric site (44CP5) is located along the railroad tracks north of the BWXT facility, and another prehistoric site (44CP22) is located within the adjacent AREVA facility. The historical significance of these resources has not been evaluated. The 9-mile Bridge (DHR Identification No. 005-0218) is located to the northeast of the facility and has been determined eligible for listing on the National Register of Historic Places.

Section 3.8 of this environmental assessment has been revised to identify the existence of these sites. As noted by DHR, the current proposed action (renewal of the license No. SNM–42) does not identify any changes in activities at the facility that are likely to have a significant impact on identified historic sites. NRC will conduct separate environmental reviews for future license amendment requests associated with proposed changes to facility operations as part of the licensing review process. Part of these reviews will take into consideration the potential for impacts to historic resources and identify any additional consultations or mitigation measures that may be necessary.

Comment: The potential impacts from future development to recorded and unrecorded archaeological resources should be considered.

Response: As noted by DHR, the current proposed action (renewal of the license No. SNM–42) does not identify any changes in activities at the facility that are likely to have a significant impact on recorded and unrecorded archaeological resources. NRC will conduct separate environmental reviews for future license amendment requests as part of the licensing review process. Part of these reviews will take into consideration the potential impacts to archaeological resources from proposed changes to existing operations and facilities and identify any additional consultations or mitigation measures that may be necessary.

Comment: Since BWXT operations at the site began in 1955, any element of the facility that dates to the earliest period of operation should be considered potentially eligible for listing on

[3]Kirchen, R.W. Letter (March 9) to J. Davis, NRC. "Comments on Docket No.: 70-27 Renewal of NRC License for BWX Technologies, Inc. DHR File No. 2003-0590." Richmond, Virginia: Commonwealth of Virginia, Department of Historic Resources. 2005. (Official Use Only)

the National Register of Historic Places. The historic significance of any structure 50 years of age or older should be evaluated when future actions at the facility are contemplated.

Response: As noted by DHR, the current proposed action (renewal of the license No. SNM–42) does not identify any changes in activities at the facility that are likely to have a significant impact on elements of the facility that are potentially eligible for listing on the National Register of Historic Places. NRC will conduct separate environmental reviews for future license amendment requests associated as part of the licensing review process. Part of these reviews will take into consideration the potential for impacts to potentially eligible structures at the facility from proposed changes to existing operations and identify any additional consultations or mitigation measures that may be necessary.

5.3 Fish and Wildlife

On **XXX (NRC to provide date)**, the NRC staff provided a copy of the draft environmental assessment for the proposed action to the Fish and Wildlife Service for review and comment. Certain security-sensitive and proprietary information was redacted from the draft as necessary. In a letter from K. Mayne of the Virginia Field Office dated March 22, 2005, the Fish and Wildlife Service expressed the view that the proposed action will not adversely affect federally listed species or federally designated critical habitat.

5.4 Virginia Council on Indians

On **XXX (NRC to provide date)**, the NRC staff discussed its preliminary findings with the Virginia Council on Indians. **[NRC to summarize discussions with VCI]**

6.0 CONCLUSION

The NRC staff concludes that the proposed renewal of license SNM–42 involving the continued NPD operations at the BWXT site in Lynchburg will not result in a significant impact to the environment. The facility is already built, and no changes to the operations are associated with the license renewal. The proposed action can be viewed as a continuation of impacts and can be evaluated based on the previous impacts from past operations.

~~Gaseous~~Airborne effluents released through stacks and liquid effluents released in the James River are below regulatory limits for nonradiological and radiological contaminants. The radiological dose associated with the exposure to these effluents for the maximally exposed individual is less than 1 percent of the NRC 1.0 mSv [100 mrem] annual limit ~~established by NRC~~ in 10 CFR 20.1301 (BWXT, 2004b). Occupational doses are also well below regulatory limits.

The environmental impacts of the proposed action have been evaluated in accordance with the requirements presented in 10 CFR Part 51. The NRC staff has determined that the renewal of license SNM–42 allowing continued NPD operations at the BWXT facility will not have a significant impact on the human environment. No environmental impact statement is required, and a finding of no significant impact is appropriate in accordance with 10 CFR 51.31.

WITHHELD

~~PRELIMINARY FINAL~~
~~PREDECISIONAL~~

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