2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS

[WAC 173-303-806(4)(a)(i), (x), (xi), (xviii)]

This section provides the following information:

- General description (facility, operations, processes)
- Topographic information
- Seismic consideration
- Traffic information

2.1 GENERAL DESCRIPTION

AREVA NP Inc. (AREVA) owns and operates a nuclear fuel fabrication plant in Richland, Washington. Certain of the fuel fabrication processes as well as a number of support and waste management activities generate wastes designated as dangerous under Ecology's Dangerous Waste Regulations (WAC 173-303). The Dangerous Waste Storage Facility (DWSF) and the Component Chemical Waste Tank (CCWT) will be permitted under final status regulations (Part B). All remaining dangerous waste management operations are categorized as permit-by-rule, treatment-by-generator or exempt recycling activities. None of the units are final disposal units.

This section provides a general facility description (location, history, ownership, etc.) and an overview of the major plant facilities and operations. Plant processes that produce dangerous wastes pertinent to the DWSF and the CCWT are described, with an emphasis on processes that are routine, recurrent, or associated with waste volumes of some significance.

2.1.1 Facility Description

The AREVA facility is located at 2101 Horn Rapids Road just within the northern limits of the city of Richland in Benton County, Washington. The facility definition includes the active manufacturing facility. A total of 52.61 acres are included in the facility definition. The land surrounding the facility (which is also owned by AREVA) is generally undeveloped with the exception of agricultural farming activity adjacent to the west side of the facility.

The facility is located within 320 acres of land owned by AREVA which is within the Horn Rapids Industrial Park. The property is situated at approximately latitude N46°21'003" and longitude W119°18'020" in Sections 15 and 16 of Township 10N, Range 28E, Willamette Meridian. The facility is located in the southwest quarter of Section 15 (15-SW1/4). The undeveloped AREVA property to the west is in the southeast quarter of Section 16 (16-SE1/4).

The property is geographically situated within the Pasco Basin in the northern portion of the Columbia Plateau, east of the Cascade Mountains. The Yakima River passes approximately 2 miles to the west, and the Columbia River is approximately 1½ miles to the east. The nearest residential areas are 1½ miles to the southwest.

The nuclear fuel fabrication plant has been in actual operation since the early 1970's. From 1969-72 the plant was constructed and operated by an operating unit of Jersey Enterprises, Inc. known as Jersey Nuclear Company. Jersey Enterprises, Inc. was a subsidiary of Standard Oil of New Jersey. Jersey Nuclear Company was incorporated in 1972 as Jersey Nuclear Company Inc. In 1983, Jersey Nuclear Company Inc. changed its name to Exxon Nuclear Company, Inc. By Stock Purchase Agreement dated December 31, 1986, Siemens Capital Corporation

purchased Exxon Nuclear Company, Inc. from Exxon. Exxon Nuclear Company, Inc. changed its name to Advanced Nuclear Fuels Corporation on January 15, 1987, to Siemens Nuclear Power Corporation on August 1, 1991, and to Siemens Power Corporation (SPC) on July 10, 1992. On February 1, 2001, SPC changed its name to Framatome ANP Richland, Inc., coinciding with the merger of the former - SPC's parent company, Siemens AG, with that of the French company, Framatome S.A. On March 19, 2001, Framatome ANP Richland, Inc. became a wholly owned subsidiary corporation of Framatome ANP, Inc., the U.S. nuclear operations corporation for the joint venture. On September 1, 2001, Framatome ANP Richland, Inc. merged into, and took the name of, its parent company, Framatome ANP, Inc. Lastly, on March 15, 2006 Framatome ANP Inc. changed its name to AREVA NP Inc. Throughout its history, the AREVA facility has operated under a license from the U.S. Nuclear Regulatory Commission (NRC).

Originally part of the Hanford Federal Facility, the AREVA property was used by various federal agencies from the early 1940's until August 1969. In 1969, Jersey Enterprises, Inc. purchased the portion of the property on which the plant is located from the City of Richland, to which the property had been briefly transferred by the United States Government. The property was transferred to Jersey Nuclear Company Inc. when it was incorporated in 1972. In 1969 Jersey Enterprises, Inc. also acquired an option on an adjacent parcel (Section 16-SE1/4) that now is part of AREVA's property. In 1975 Jersey Nuclear Company Inc. exercised the option and purchased the property from the City of Richland.

2.1.2 Overview of Current Plant Facilities and Operations

The AREVA nuclear fuel fabrication plant in Richland, Washington produces enriched uranium nuclear fuel for use in commercial light water reactors. Finished

fuel assemblies (bundles) are supplied to nuclear utilities for direct usage as fuel in their nuclear power reactors, however intermediate products such as enriched uranium powder or pellets are also produced in behalf of other nuclear fuel cycle facilities.

The typical feed material to the plant is uranium hexafluoride (UF_6) received in 30-inch diameter steel cylinders, each containing approximately 1500 kilograms of enriched uranium. The UF_6 is chemically converted to uranium dioxide (UO_2) powder, which is pressed into fuel pellets, which in turn are subsequently loaded into fuel rods. These loaded fuel rods, in conjunction with other supporting hardware (tie plates and grid spacers), are assembled into a variety of fuel bundle designs, depending on the customer-specific requirements.

The chemical conversion technology utilized at AREVA for the UF6 to UO2 conversion relies on a "dry", single-stage, vapor phase conversion process. The dry conversion process produces a comparatively small volume liquid waste stream, with nearly all of the fluorides in the reactor offgas stream being condensed to produce a marketable hydrofluoric acid (HF) byproduct.

AREVA also operates a "wet" ammonium diuranate (ADU) conversion process which is limited to the wet recycle of off-specification or impure ("dirty") UO2 powder or pellets ("uranium scrap"). The ADU process produces ammonia and nitrate-containing liquid dangerous (state-only) wastes that are processed for uranium and ammonia recovery via the AREVA wastewater treatment system.

The primary fuel production and support activities occur onsite at a number of key facilities. The most significant of those facilities, all of which are depicted in Exhibit 1-1 (AREVA Site Plan), are as follows:

Dry Conversion Facility - AREVA's primary production facility uses a UF_6 to UO_2 conversion process known as dry conversion. In comparison with the wet ADU uranium scrap recovery process, the volume of liquid wastes generated from dry conversion are significantly reduced. In addition, more than 90 percent of the fluoride from the UF_6 is condensed as hydrofluoric acid and sold.

Uranium Dioxide (UO_2) Building - This is the main operating facility onsite, housing the majority of the fuel fabrication activities including pelletizing, pellet sintering, rod loading, and bundle assembly. Other related activities/facilities include scrap recovery facilities, the U_3O_8 Facility, the Miscellaneous Uranium Recovery System (MURS), the Powder Storage Facility, and various laboratory facilities.

Specialty Fuels (SF) Building - This facility produces uranium fuel pellets containing the neutron poison gadolinium (neutron absorber fuel, or NAF). After blending UO_2 powder (received from the UO_2 Building) with gadolinia (an oxide of gadolinium), processing proceeds much the same as in the UO_2 Building (powder preparation, pelletizing, etc.). The SF Building also houses the Solid Waste Uranium Recovery (SWUR) Facility, where uranium is thermally recovered from non-dangerous, uranium-containing combustible wastes.

Engineering Laboratory Operations (ELO) Building - The ELO Building is a combination facility housing production, engineering testing/development, laboratory, and office activities. The production process is the Gadolinium Scrap Uranium Recovery (GSUR) process used to remove gadolinia and other impurities from various uranium feed streams to produce uranyl nitrate solution for subsequent conversion to UO_2 in the UO_2 Bldg. Since GSUR is a solvent extraction process, the facility is also often referred to as the Solvent Extraction, or SX, Facility.

Component Center - The component center, historically referred to as the Machine Shop, fabricates rod end caps, tie plates, and assembles spacers used as component hardware in the fabrication of fuel bundles. Once fabricated, these metallic components are chemically treated via the component pickling process. The Component Chemical Waste Tank (CCWT), which receives liquid acidic waste from the pickling of fuel assembly components, is located outside of the northwest corner of the Component Center.

Ammonia Recovery Facility (ARF) - The ARF is a key waste management facility which provides several recycling/treatment functions relative to AREVA's liquid effluent streams. Most important of these functions is the recovery of ammonium hydroxide from ADU conversion effluents. Other processes and tanks of note which are housed in ARF include the Ion Exchange (IX) Columns, which recover residual uranium from Tank 714 prior to discharge to the POTW; the IX Column Neutralization/Metals Removal Unit, which provides treatment of a waste stream associated with the IX column regeneration process; sand filters which remove solids prior to sewering of effluent; IX and sand filter backwash tank; Tanks 713-A and 713-B which are the ADU/MURS waste tanks/ammonia feed tanks; and Tank 714 which is the final wastewater tank prior to the IX columns.

2.1.3 Categories of Dangerous Wastes Managed

Onsite production and support activities at the AREVA nuclear fuel fabrication facility generate a wide array of dangerous waste streams. By volume, the most significant category of wastes generated is state-only criteria (toxic) wastes. Other categories include federal/state characteristic (most notably corrosive), federal/state listed, and on an infrequent basis, discarded commercial chemical products. Specific information on dangerous waste streams generated and managed onsite

can be found in the Part A Permit (Section 1.0 of this permit application) and Attachment 3-1, the Waste Analysis Plan and associated Waste Data Sheets. Detailed information on the major dangerous waste generating processes which generate containerized wastes destined for storage at the DWSF and liquid wastes discharged to the CCWT is provided below.

2.1.4 Dangerous Waste Generating Processes for the DWSF

Provided below is information on certain specific dangerous waste-generating plant processes/activities which generate wastes that are stored at the DWSF and that are routine, recurrent, or associated with waste volumes of some significance. In some cases, certain miscellaneous waste generating processes that are similar in waste stream generation, characteristics, or management techniques have been addressed as categories as opposed to individual points of generation e.g. mixed waste HEPA ventilation filters/pre-filters generated in the filtration of airborne effluents or miscellaneous wastes collected via satellite accumulation.

Mixed Waste Generating Processes

Location: Various locations in liquid chemical processing/handling areas, primarily in the UO_2 and ELO Buildings.

Waste Form/Management: Liquid-chemical and radiologically contaminated mop heads, filter cartridges, rags, and miscellaneous debris accumulated primarily via satellite accumulation.

Process Description: "Wet waste" is a term utilized at AREVA to denote radiologically-contaminated solid phase wastes that are wet or damp. When the chemical(s) imparting the moisture to the solid wastes cause the waste to designate as dangerous per WAC 173-303, the result is a mixed wet waste. The two processes responsible for generating nearly all of AREVA's mixed wet

wastes are the in-line filtration of nitric acid- based, uranium-containing liquid process streams and the use of nitric acid solutions to perform mopping and general cleanup in radiation contamination zones. The dominant waste forms found in mixed wet wastes are therefore in-line process filters (cartridge or "sock" styles), mop heads, and rags. Mixed wet wastes are typically satellite accumulated and then stored on the dangerous waste storage pad.

Processes/Activities Serviced via Satellite Waste Accumulation

Location: Various locations in production and support facilities plantwide.
Waste Form/Management: Various solid and liquid wastes accumulated in satellite accumulation containers ranging in size from 5 to 55 gallons.
Process Description: A significant number of points of dangerous waste generation throughout plant production and support facilities generate wastes in a form, at a frequency, and in volumes best serviced via satellite accumulation stations. The satellite container collection areas accumulate a wide array of wastes, including but not limited to batteries, chemically-contaminated rags, spent laboratory standards, paint wastes, spent solvents, used protective clothing and process offgas prefilters. AREVA's Licensing & Compliance section maintains a document describing each satellite station with respect to wastes accumulated, responsible individual, applicable waste codes and hazard labels, container type, shipping name, and waste disposition.

Airborne Effluent Filtration

Location: Various industrial ventilation systems servicing chemical processing/handling operations in the UO_2 (primarily), ELO, and SF Buildings.
Waste Form/Management: High Efficiency Particulate Absorber (HEPA) air filters and associated pre-filters.
Process Description: All plant areas that process radioactive materials in an

unencapsulated form are required by AREVA's NRC license to be serviced by HEPA-filtered ventilation systems. Processing/handling of certain non-radioactive chemicals in those areas therefore creates the potential for these HEPA filters and their associated pre-filters to be mixed wastes. AREVA has designated each point of generation of spent ventilation filters under the Dangerous Waste Regulations based on a combination of process knowledge, sampling and analysis, and/or amount of filter loading. The most significant number of mixed waste filters derive from the chemical conversion area of the UO_2 Building, where the ADU conversion and associated processes result in the deposition of process-related chemicals such as ammonium nitrate on ventilation filters. All mixed waste HEPAs and pre-filters generated onsite designate due to state-only criteria of toxicity or corrosivity. Spent mixed waste filters are stored at the DWSF pending shipment for offsite disposal.

2.1.5 Dangerous Waste Generating Processes for the CCWT

Provided below is a description of processes which generate wastes managed in the CCWT.

Component Chemical Waste Tank (CCWT)

Location: Outside of the northwest corner of the Component Center, which is located on the western edge of the AREVA nuclear fuel fabrication facility.

Waste Form/Management: The CCWT manages chemical wastes generated from the pickling of metallic nuclear fuel fabrication components.

Process Description: Chemical wastes are derived from the pickling process, a chemical process applied to stainless steel components to remove any free iron from the component surfaces and impart a corrosion resistant oxide coating. The pickling solution is a combination of deionized water, nitric acid (1-2 M),

oxalic acid (~5%), and an organic surfactant/wetting agent(<1%). Batches of spent pickling solution (~27 gallons ea.) are pumped from the process dip tank to the CCWT approximately every 2-3 weeks. Between batches the tank is rinsed with water, with the rinsate also routed to the CCWT.

Liquid wastes from the CCWT are periodically transferred to an offsite vendor for ultimate treatment and disposal.

2.2 TOPOGRAPHIC INFORMATION

A topographic map, showing a distance of over 1 mile around the AREVA facility is provided in the Part A Permit Application. This map is drawn at a scale of 1 inch equals approximately 2100 feet. The contour interval (2.0 feet) clearly shows the pattern of surface water flow. The drawing contains the following information:

- Map scale
- 100-year floodplain
- Surface waters
- Surrounding land uses
- North arrow
- The AREVA facility and property boundaries

The topographic map and site plan (also included in the Part A Permit Application, Section 1 of the permit application), provide the following information required for regulated units:

- Access control points
- Buildings, TSD operational units, and other structures

- Delineation of waste management areas

WAC 173-303-806(4)(xviii) also requires that the topographic map identify locations of injection or withdrawal wells and barriers for drainage or flood control. No injection wells or production wells are present on or near the site.

2.3 SEISMIC CONSIDERATION

The AREVA facility is located in Benton County, Washington within seismic Zone 2B of the Uniform Building Code. Both the DWSF and CCWT meet the seismic criteria consideration and are able to withstand and exceed the maximum horizontal acceleration requirements for a 0.12 g operation basis seismic event.

2.4 TRAFFIC INFORMATION

Traffic to and from the DWSF and CCWT follows established routes for access and egress. Typically, dangerous wastes are shipped offsite on a quarterly basis, with additional shipments on an as-needed basis. All on-site roads and waste container loading areas are constructed of asphalt with appropriate load bearing capacity.